

Analysis distribution and segmentation of micro, small, and medium enterprises (MSMEs) in Kediri Residency Area: implications for local economic development

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) are critical drivers of economic growth, especially in developing nations like Indonesia. This study focuses on the specific case of Kediri Residency, using 2018 data from the Central Bureau of Statistics of East Java Province to uncover insights for sustainable local economic development. Our methodology involved data acquisition, parsing, mining, filtering, and representation/interaction. This process yielded a dataset of 168 data points, providing a nuanced view of MSMEs in Kediri Residency. Our analysis highlighted significant trends. Kediri Regency, for example, excelled in the Food and Beverage Industry (270 MSMEs) and Wood Industry (260 MSMEs). Blitar Regency thrived in the Wood Industry (235 MSMEs) and the Food and Beverage Industry (230 MSMEs). Tulungagung Regency showed strength in the Wood Industry (219 MSMEs). These findings have strategic implications for local economic development, such as sectoral strengthening, enhancing competitiveness, forming business clusters, and tailoring policies to MSMEs' unique needs. Comparing Kediri City to Kediri Regency and Blitar City to Blitar Regency revealed disparities and opportunities, highlighting the role of local policies and infrastructure in MSME development. In conclusion, our research provides actionable insights to formulate policies, develop infrastructure, improve financing access, and enhance skills training programs. These actions will catalyze MSME growth, promoting regional economic development and stability.

Keywords: data analysis, local economic development, local governments, MSMEs report

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Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in the economic growth of a country [1]. These enterprises are characterized by their small-scale operations, limited resources, and relatively low workforce [2]. Despite their modest size, MSMEs make significant contributions to the national economy [3], [4], particularly in developing countries like Indonesia. In Indonesia, MSMEs make significant contributions to the national economy by creating jobs, increasing income for the population, and driving local economic development [5]. Due to their decentralized nature, MSMEs are often located in rural and semi-urban areas, where large-scale industries may have a limited presence [6]. By providing employment opportunities, MSMEs contribute to reducing unemployment rates, alleviating poverty, and promoting inclusive growth [7].

Data visualization is like a magic wand that turns raw data into clear and understandable pictures [8]. It's a way of presenting information visually, using charts, graphs, and other visual elements that make it easier for our brains to process and understand complex data [9]. In today's world, where data is abundant and often overwhelming, data visualization is a crucial tool for

making sense of it all [10]. When we look at raw data, such as long lists of numbers or rows and columns in a spreadsheet, it can be difficult to see the patterns and insights hidden within [10]. That's where data visualization comes in. It takes this raw data and transforms it into visual representations that we can easily grasp and interpret [11]. It's like putting on a pair of glasses that make everything clearer.

This highlights the importance of analyzing the distribution and segmentation of MSMEs in specific regions, such as the Kediri Residency, to gain insights into their characteristics, distribution patterns, and potential for local economic advancement with data visualization. Through the analysis of MSME distribution and segmentation, a comprehensive understanding of the conditions and prospects for local economic development in the Kediri Residency can be obtained. This knowledge will serve as a basis for local governments, financial institutions, and industry players to devise more effective and efficient strategies for economic development. By comprehending the distribution and segmentation of MSMEs, targeted initiatives can be implemented, including tailored assistance, training, market access, or financing to meet the specific needs of different MSME segments.

In the context of local economic development, the findings from the analysis of MSME distribution and segmentation in the Kediri Residency hold significant implications. These implications involve identifying opportunities to strengthen specific MSME sectors, enhancing business competitiveness in particular market segments, forming business clusters, and developing infrastructure and supportive policies that align with the unique characteristics and requirements of MSMEs in each locality.

This scientific article aims to conduct an analysis of MSME distribution and segmentation in the Kediri Residency, utilizing data from the Central Bureau of Statistics of East Java Province in 2018. The objective is to explore strategic implications that can foster sustainable local economic development. The research is expected to contribute to the formulation of policies and concrete measures that promote inclusive and sustainable MSME growth, while also bolstering long-term regional economic stability.

Methodology

The research methodology employed in the data processing process is illustrated in Figure 1. The data visualization undergoes five stages using the method presented by Ben Fry [12], namely acquire, parse, mine, filter, represent/ refine, and interact.

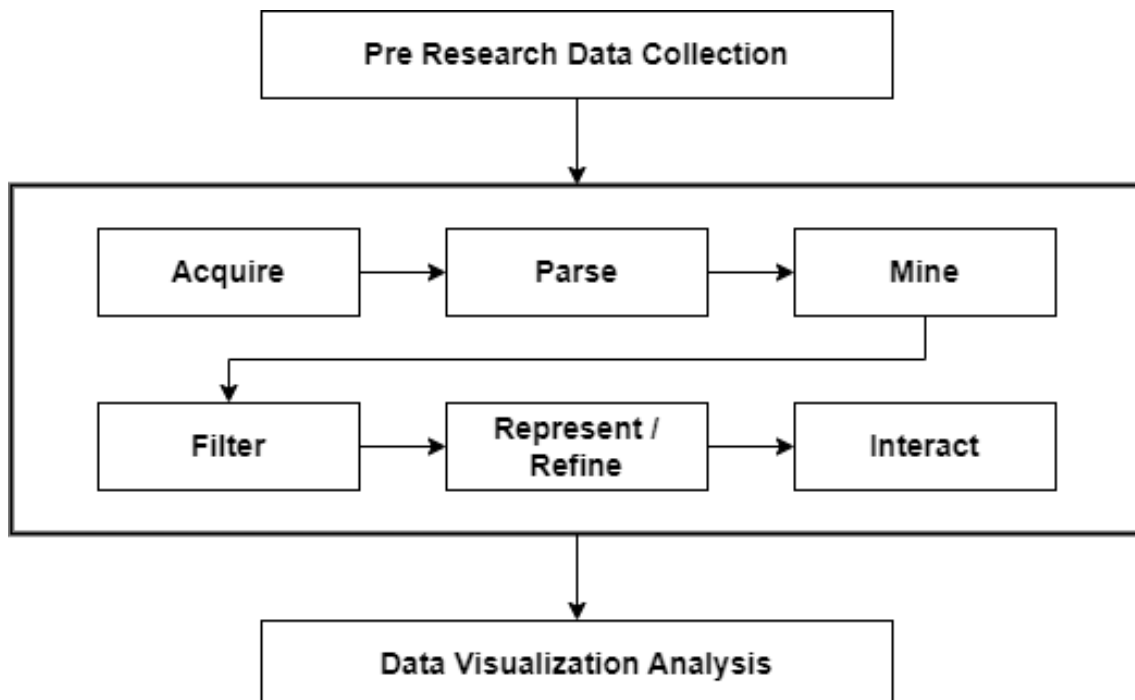


Figure 1. Data Processing Methodology

The pre-research data collection process was conducted to gather the necessary information to achieve the research objectives. After going through the pre-research process, the following steps were undertaken to acquire, parse, mine, filter, represent/refine, and interact. In simple terms, acquiring data means gathering information from different sources. It could involve conducting surveys, interviews, or accessing existing databases or online resources to collect the necessary data for analysis [13]. Parsing is like breaking down the acquired data into smaller, manageable parts [14]. It's like organizing the data and making sure it's in the right format for further analysis. This step helps in cleaning up the data and making it easier to work with. Data mining is all about exploring the data to find interesting patterns or relationships within it [15]. It's like digging deep into the data to discover valuable insights and hidden information that can help in understanding trends or making predictions. Filtering is about refining the data by removing unnecessary or irrelevant information. It's like separating the wheat from the chaff, keeping only the data that is important for the analysis. Filtering helps in focusing on the relevant aspects and getting rid of any noise that might affect the results [16]. Representing or refining the data means transforming it into visualizations or summaries that are easier to understand. It's like creating charts, graphs, or other visual representations that make it simpler to grasp the key findings and trends present in the data. Refining the data may also involve further analysis or processing to improve its quality or accuracy. Interacting with the data means being able to explore and play around with the visualizations or representations [17]. It's like having the ability to zoom in, filter out specific data points, or ask questions about the data. Interactivity allows users to have a hands-on experience with the data and gain deeper insights by actively engaging with it. After going through the process, an analysis was conducted based on the visualization of the obtained data for the scientific article.

Results and Discussions

The raw data for this study was obtained from the Central Bureau of Statistics of East Java Province, titled "Number of Villages by Existence and Type of Micro and Small Industries in Districts/Cities in 2018." The initial raw data consisted of MSME data from all districts/cities in East Java. However, since this research focuses on the MSMEs in the Kediri Residency, only the data from this specific region, including Kota Kediri, Kota Blitar, Kabupaten Kediri, Nganjuk, Tulungagung, Trenggalek, and Blitar, was used.

The available data consists of MSME data for the year 2018, with a data structure comprising 304 rows and 3 columns with a total of 912 data. This research focuses on the MSMEs in the Kediri Residency, then we utilize 56 rows and 3 columns with a total of 168 data. The columns contain the names of the districts/cities, the types of industries, and the number of MSMEs. There are eight types of MSMEs listed in the "Type of Industries" column, including Leather Industry, Wood Industry, Precious Metals and Metal Materials Industry, Pottery/Ceramics/Stone Industry, Fabric/Textile Industry, Food and Beverage Industry, and Other Industries.

Once the data was obtained, a data pre-processing step known as data editing was performed. During this stage, the data was cleaned, ensuring that it matched the respective columns. Redundant and duplicate data were also eliminated. In this case study, we assigned a value of 0 to any empty data cells.

Using the Python programming language and charts, we were able to analyze the predominant types of industries among the residents of the Kediri Residency. This analysis allowed us to understand the relationship between the types of businesses and the potential of each area.

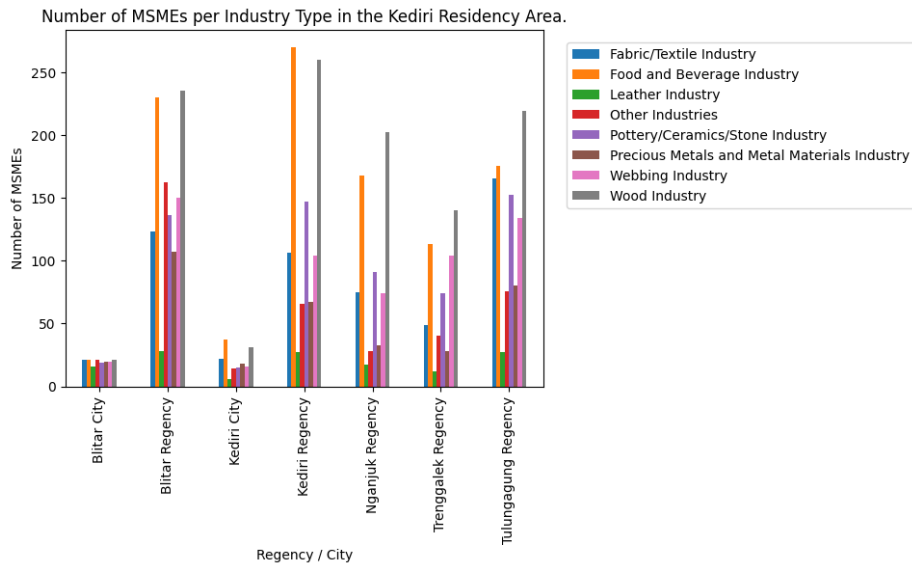


Figure 2. Data distribution of the Number of MSMEs per Industry Type in the Kediri Residency

Table 1. Top five prevalent types of businesses operating within the Kediri Residency Area

Regency/ City	Types of Industry	Number of MSMEs in 2018
Kediri Regency	Food and Beverage Industry	270
Kediri Regency	Wood Industry	260
Blitar Regency	Wood Industry	235
Blitar Regency	Food and Beverage Industry	230
Tulungagung Regency	Wood Industry	219

Figure 2 shows the data distribution of the Number of MSMEs per Industry Type in the Kediri Residency. To enhance the readability of Figure 2, a complementary Table 1 has been created, presenting the top five prevalent types of businesses operating within the Kediri Residency Area. In the provided data, several regency cities have the largest number of micro, small, and medium enterprises (MSMEs) in specific industries. In Kediri Regency, the Food and Beverage Industry has a total of 270 MSMEs, while the Wood Industry has 260 MSMEs. This indicates that Kediri Regency has significant potential in the food and beverage sector as well as the wood industry. Moving on to Blitar Regency, the Wood Industry dominates with 235 MSMEs, while the Food and Beverage Industry has 230 MSMEs. Blitar Regency also shows significant potential in the wood industry and the food and beverage sector. Lastly, in Tulungagung Regency, the Wood Industry has a total of 219 MSMEs. This signifies that the wood industry also plays an important role in the economy of Tulungagung Regency.

This data provides an overview of industries with significant numbers of micro, small, and medium enterprises in each regency city. This information can be used to identify sectors with potential for further development and as drivers of economic growth in each region.

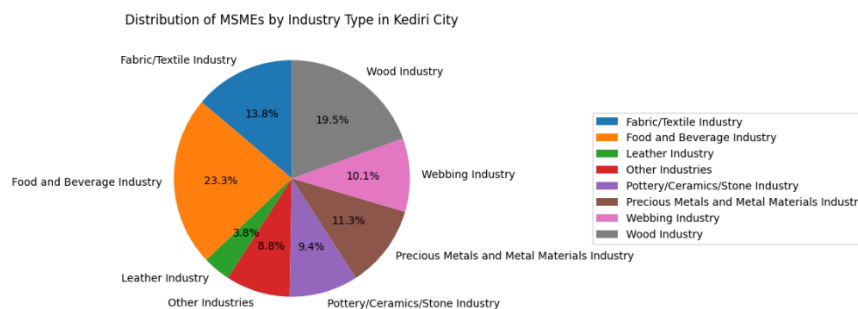


Figure 3. Distribution of MSMEs by Industry Type in Kediri City

Figure 3 shows in distribution of MSMEs by Industry Type in Kediri City. Analyzing the data provided for Kediri City, we can observe the distribution of micro, small, and medium enterprises (MSMEs) across various industries. The Fabric/Textile Industry represents 22 MSMEs, accounting for 13.8% of the total MSMEs. The Food and Beverage Industry comprises 37 MSMEs, which make up 23.3% of the MSMEs. The Leather Industry encompasses 6 MSMEs, equivalent to 3.8% of the total. Other Industries include 14 MSMEs, representing 8.8% of the MSMEs. The Pottery/Ceramics/Stone Industry consists of 15 MSMEs, accounting for 9.4% of the total. The Precious Metals and Metal Materials Industry comprises 18 MSMEs, making up 11.3% of the MSMEs. The Webbing Industry encompasses 16 MSMEs, equivalent to 10.1% of the total. Lastly, the Wood Industry consists of 31 MSMEs, representing 19.5% of the MSMEs. The cumulative number of MSMEs in Kediri City amounts to 159.

In summary, the data highlights the distribution of MSMEs across different industries in Kediri City, showcasing the diverse economic landscape of the region. The Food and Beverage Industry and the Wood Industry emerge as the prominent sectors with the highest number of MSMEs. This indicates their significance in the local economy and potential for further growth. Conversely, the Leather Industry exhibits a smaller presence, suggesting the need for targeted support and development initiatives. The data provides valuable insights for policymakers and stakeholders to formulate strategies that promote the growth and sustainability of MSMEs in Kediri City.

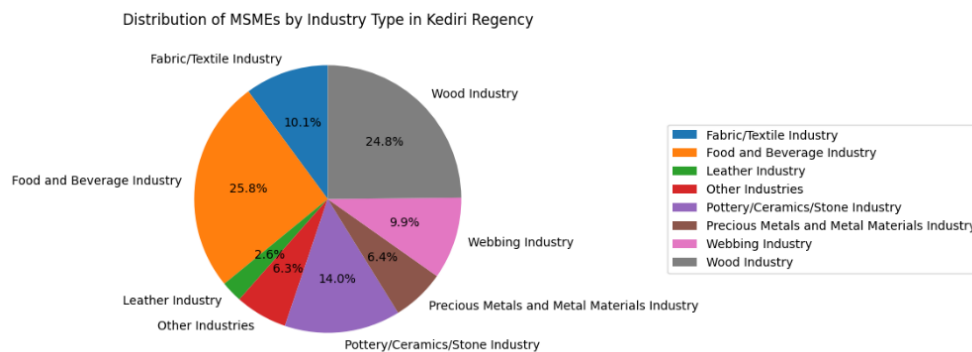


Figure 4. Distribution of MSMEs by Industry Type in Kediri Regency

Figure 4 looks at the distribution of MSMEs by Industry Type in Kediri Regency. Analyzing the provided data for Kediri Regency, we can observe the distribution of micro, small, and medium enterprises (MSMEs) across different industries. The Fabric/Textile industry comprises 106 MSMEs, representing 10.1% of the total MSMEs. The Food and Beverage industry encompasses 270 MSMEs, accounting for 25.8% of the MSMEs. The Leather industry consists of 27 MSMEs, equivalent to 2.6% of the total. Other industries encompass 66 MSMEs, representing 6.3% of the MSMEs. The Pottery/Ceramics/Stone industry consists of 147 MSMEs, making up 14% of the total. The Precious Metals and Metal Materials industry comprises 67 MSMEs, accounting for 6.4% of the MSMEs. The Webbing industry encompasses 104 MSMEs, equivalent to 9.9% of the total. Lastly, the Wood industry consists of 260 MSMEs, representing 24.8% of the MSMEs. The cumulative number of MSMEs in Kediri Regency amounts to 1047.

Upon analysis, the Food and Beverage industry and the Wood industry emerge as the largest sectors in terms of MSME numbers and their impact on the local economy. The Fabric/Textile industry also plays a significant role in manufacturing. However, the Leather industry has a smaller presence, indicating room for targeted support. The diverse industries, including Pottery/Ceramics/Stone, Precious Metals and Metal Materials, and Webbing, contribute to Kediri Regency's economic vibrancy. Policymakers can use this data to identify sector-specific strengths and weaknesses, promoting sustainable MSME growth and overall economic development.

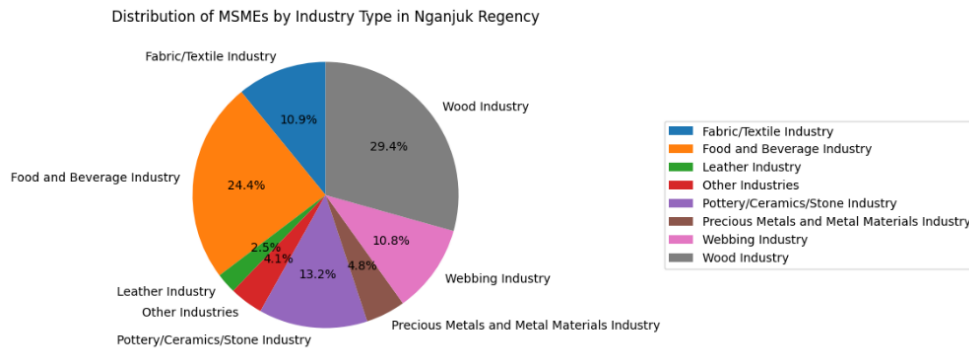


Figure 5. Distribution of MSMEs by Industry Type in Nganjuk Regency

Figure 5 illustrates the distribution of MSMEs by Industry Type in Nganjuk Regency. The data presented provides an overview of the distribution of micro, small, and medium enterprises (MSMEs) across different industries in Nganjuk Regency. The Fabric/Textile industry accounts for 75 MSMEs, representing 10.9% of the total MSMEs. The Food and Beverage industry comprises 168 MSMEs, making up 24.4% of the MSMEs. The Leather industry consists of 17 MSMEs, representing 2.5% of the MSMEs. Other industries encompass 28 MSMEs, accounting for 4.1% of the MSMEs. The Pottery/Ceramics/Stone industry comprises 91 MSMEs, representing 13.2% of the MSMEs. The Precious Metals and Metal Materials industry consists of 33 MSMEs, representing 4.8% of the MSMEs. The Webbing industry encompasses 74 MSMEs, accounting for 10.8% of the MSMEs, and the Wood industry consists of 202 MSMEs, representing 29.4% of the MSMEs. The total number of MSMEs in Nganjuk Regency amounts to 688.

The data suggests that Nganjuk Regency possesses significant potential for MSME development, particularly in the Food and Beverage and Wood industries. By formulating targeted strategies and providing comprehensive support, the government can nurture a conducive environment for MSMEs, leading to economic growth, job creation, and sustainable development in Nganjuk Regency.

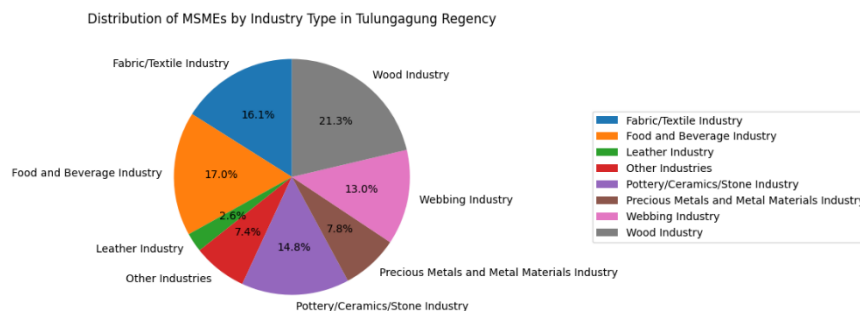


Figure 6. Distribution of MSMEs by Industry Type in Tulungagung Regency

Figure 6 describes the distribution of MSMEs by Industry Type in Tulungagung Regency. In Tulungagung Regency, the provided data reveals the distribution of micro, small, and medium enterprises (MSMEs) across various industries. The Fabric/Textile industry comprises 165 MSMEs (16.1%), the Food and Beverage industry encompasses 175 MSMEs (17%), the Leather industry consists of 27 MSMEs (2.6%), the other industries encompass 76 (7.4%) MSMEs, the Pottery/Ceramics/Stone industry consists of 152 MSMEs (14.8%), the Precious Metals and Metal Materials industry comprises 80 MSMEs (7.8%), the Webbing industry encompasses 134 MSMEs (13%), and the Wood industry consists of 219 MSMEs (21.3%). The cumulative number of MSMEs in Tulungagung Regency amounts to 1028.

Based on the data analysis, the government of Tulungagung Regency should consider specific measures to foster the growth and development of certain industries. Given the significant number of MSMEs in the Fabric/Textile, Food and Beverage, Pottery/Ceramics/Stone, and Wood industries, policymakers could prioritize targeted support in terms of infrastructure development,

access to financing, and skills training programs. By focusing on these industries, the government can create an enabling environment that encourages entrepreneurship, enhances productivity, and stimulates job creation, ultimately contributing to the overall economic progress and welfare of Tulungagung Regency.

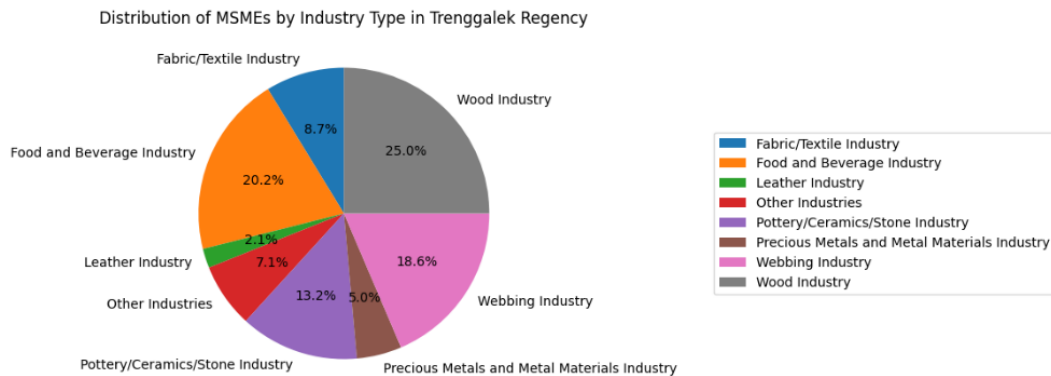


Figure 7. Distribution of MSMEs by Industry Type in Trenggalek Regency

Figure 7 provided illustrates the distribution of micro, small, and medium enterprises (MSMEs) across various industries in Trenggalek Regency. The Fabric/Textile industry comprises 49 MSMEs (8.7%), the Food and Beverage industry encompasses 113 MSMEs (20.2%), the Leather industry consists of 12 MSMEs (2.1%), the other industries encompass 40 MSMEs (7.1%), the Pottery/Ceramics/Stone industry consists of 74 (13.2%) MSMEs, the Precious Metals and Metal Materials industry comprises 28 MSMEs (5%), the Webbing industry encompasses 104 MSMEs (18.6%), and the Wood industry consists of 140 MSMEs (25%). The cumulative number of MSMEs in Trenggalek Regency amounts to 560.

Upon analysis of the data, that the Wood industry has the highest number of MSMEs, indicating its significance in the local economy. The Food and Beverage industry also demonstrates a considerable presence, followed by the Fabric/Textile industry. Conversely, the Leather industry has the lowest number of MSMEs. These findings suggest that the Wood industry holds potential for growth and further investment, while the Leather industry may require additional support and development initiatives. Additionally, the presence of MSMEs in diverse industries highlights the economic diversity within Trenggalek Regency, contributing to employment opportunities and overall economic stability.

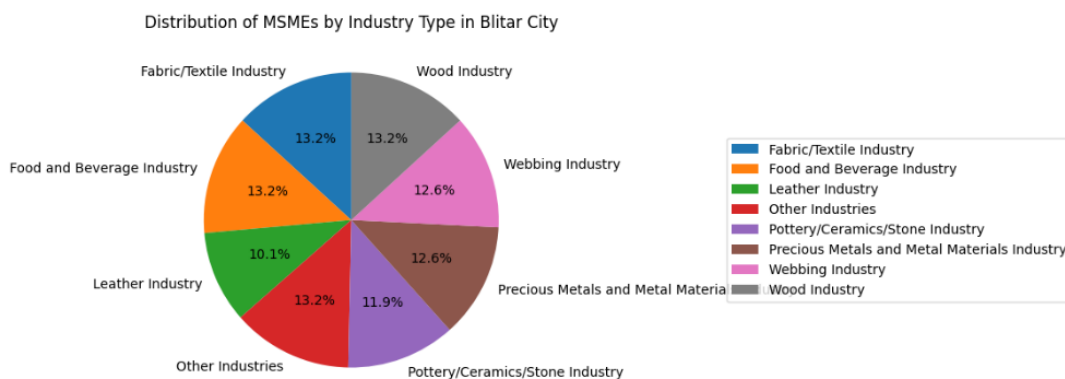


Figure 8. Distribution of MSMEs by Industry Type in Blitar City

Figure 8 given data reveals the distribution of micro, small, and medium enterprises (MSMEs) across various industries in Blitar City. The data provided indicates that the Fabric/Textile and Food and Beverage industries have the highest number of MSMEs, with 21 businesses each,

accounting for 13.2% of the total. The Leather industry has a smaller representation with 16 MSMEs (10.1%), while the Pottery/Ceramics/Stone industry has 19 MSMEs (11.9%). The Precious Metals and Metal Materials industry and the Webbing industry both consist of 20 MSMEs (12.6%), and the Wood industry also has 21 MSMEs (13.2%). In total, there are 159 MSMEs in Blitar City.

Analysis of the data reveals a balanced distribution of MSMEs across various industries, with the Fabric/Textile and Food and Beverage sectors leading the way. These findings suggest the potential for growth and investment in these industries. The Leather industry may require additional support and development initiatives due to its smaller representation. The presence of MSMEs in diverse industries highlights the economic diversity within Blitar City, contributing to employment opportunities and overall economic stability.

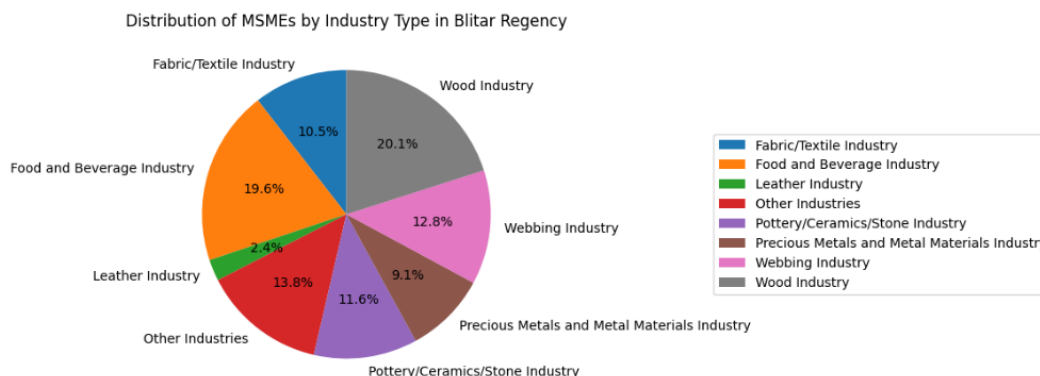


Figure 9. Distribution of MSMEs by Industry Type in Blitar Regency

Figure 9 provided data showcases the distribution of micro, small, and medium enterprises (MSMEs) across various industries in Blitar Regency. Among the different industries, the Wood industry stands out with the highest number of MSMEs, totaling 235 (20.1%). This indicates the significant presence and contribution of the Wood industry to the local economy.

Following closely behind is the Food and Beverage industry with 230 MSMEs (19.6%), highlighting its importance as well. The Fabric/Textile industry also demonstrates a substantial presence, comprising 123 MSMEs (10.5%). Additionally, the Other Industries category encompasses 162 MSMEs (13.8%), showcasing a diverse range of businesses in different sectors. The Pottery/Ceramics/Stone industry contributes 136 MSMEs (11.6%), while the Precious Metals and Metal Materials industry comprises 107 MSMEs (9.1%). The Leather industry accounts for 28 MSMEs (2.4%), and the Webbing industry includes 150 MSMEs (12.8%). Overall, the total number of MSMEs in Blitar Regency amounts to 1171.

This data indicates a vibrant entrepreneurial landscape and economic activity within the region. The findings suggest the significance of industries such as Wood, Food and Beverage, and Fabric/Textile, which may present opportunities for further growth and development initiatives. Moreover, the presence of MSMEs across various industries highlights the economic diversity and potential for employment generation in Blitar Regency.

We aim to compare data from adjacent areas, namely Kediri City and Kediri Regency, as well as Blitar City and Blitar Regency, to examine their similarities and differences.

Table 2. Comparison of MSME data for the Kediri City and Kediri Regency

Types of Industry	Number of MSMEs in 2018 in Kediri City	Number of MSMEs 2018 in Kediri Regency
Fabric/Textile Industry	22	106
Food and Beverage Industry	37	270
Leather Industry	6	27
Other Industry	14	66
Leather Industry	15	147

Precious Metals and Metal Materials Industry	18	67
Webbing Industry	16	104
Wood Industry	31	260

Table 2 describes MSME data for the Kediri City and Kediri Regency. The analysis of the data reveals significant differences in the distribution of micro, small, and medium enterprises (MSMEs) between Kediri City and Kediri Regency. Kediri Regency demonstrates a larger number of MSMEs in almost all recorded industry sectors compared to Kediri City. For instance, the Fabric/Textile Industry sector has 106 MSMEs in Kediri Regency, significantly higher than the 22 MSMEs in Kediri City. Similarly, the Food and Beverage Industry sector also exhibits a notable disparity, with 270 MSMEs in Kediri Regency and 37 MSMEs in Kediri City.

These variations can be attributed to factors such as economies of scale, market accessibility, and local government policies. Kediri Regency may possess better infrastructure and policy support for MSME development, thus attracting a larger number of businesses in specific industry sectors.

In addressing these disparities, the government's stance becomes crucial. The government needs to assess the potential and requirements of each industry sector in both areas and design appropriate strategies to strengthen underdeveloped sectors. For instance, for sectors with a lower number of MSMEs, such as the Leather Industry in Kediri City, the government can provide incentives and specialized development programs to stimulate sector growth. Additionally, the government should enhance infrastructure, market access, and skill training for entrepreneurs in both areas to enhance the competitiveness and productivity of MSMEs.

With a proactive approach and well-designed strategies, the government can foster balanced and sustainable growth for MSMEs in both Kediri City and Kediri Regency, creating a conducive environment for the development of micro, small, and medium enterprises to support overall regional economic growth.

Table 3. Comparison of MSME data for the Blitar City and Blitar Regency

Types of Industry	Number of MSMEs in 2018 in Kediri City	Number of MSMEs 2018 in Kediri Regency
Fabric/Textile Industry	21	123
Food and Beverage Industry	21	230
Leather Industry	16	28
Other Industry	21	162
Leather Industry	19	136
Precious Metals and Metal Materials Industry	20	107
Webbing Industry	20	150
Wood Industry	21	235

Table 3 describes MSME data for the Blitar City and Blitar Regency. The provided data showcases the comparison of micro, small, and medium enterprises (MSMEs) between Blitar City and Blitar Regency. The analysis reveals variations in the number of MSMEs across different industry sectors in the two areas.

In Blitar City, there are notable similarities in the number of MSMEs compared to Blitar Regency in the Fabric/Textile Industry, Food and Beverage Industry, Other Industries, and Wood Industry. However, differences emerge in specific sectors. The Leather Industry in Blitar City has 16 MSMEs, whereas Blitar Regency has 28 MSMEs. This suggests a potential for further development and support of the Leather Industry in Blitar City. Additionally, Blitar Regency demonstrates a stronger presence in the Pottery/Ceramics/Stone Industry and the Precious Metals and Metal Materials Industry, with higher numbers of MSMEs compared to Blitar City.

The data highlights the significance of the Food and Beverage Industry and the Wood Industry in both Blitar City and Blitar Regency, as they exhibit similar numbers of MSMEs in each

area. This indicates their importance in the local economy and their growth potential. To address the disparities observed, policymakers can consider implementing targeted measures. In Blitar City, efforts can focus on supporting and promoting the Leather Industry, while in Blitar Regency, nurturing the Pottery/Ceramics/Stone Industry and the Precious Metals and Metal Materials Industry can be prioritized.

Overall, this comparison of MSME data between Blitar City and Blitar Regency emphasizes the need for strategic policies to foster balanced development across industry sectors. By addressing sector-specific challenges and leveraging strengths, policymakers can promote the growth of MSMEs, stimulate economic activity, and generate employment opportunities in both Blitar City and Blitar Regency.

Conclusion

This scientific paper delves into a detailed examination of the distribution and segmentation of Micro, Small, and Medium Enterprises (MSMEs) within Kediri Residency. The data utilized for this analysis was sourced from the Central Statistics Agency of East Java Province, specifically from the year 2018. The data underwent a meticulous processing methodology, which encompassed five essential stages: editing, classification, verification, analysis, and, most notably, the formulation of conclusive findings.

The final determinations and crucial insights gathered from this exhaustive investigation of the MSME landscape in Kediri Residency. For instance, the data portrays the substantial presence of industries like Food and Beverage and Wood in both Kediri and Blitar Regency, underscoring their significance and potential for growth. Conversely, the Leather Industry exhibits a smaller presence, signaling a need for targeted support and development initiatives in Kediri City and Blitar City. The comparison tables between Kediri City and Kediri Regency, Blitar City, and Blitar Regency reveal significant differences in the distribution of MSMEs across various industry sectors, signaling the importance of regional policies and infrastructure in fostering these businesses. Industries like Fabric/Textile and Food and Beverage exhibit vast differences in MSME numbers between the city and regency areas, underlining the need for a nuanced approach to addressing these disparities.

The strengths lie notably in the dominance of the Food and Beverage industry, especially in Kediri Regency, along with the significant presence of the Wood industry across multiple areas, signifying a strong local economy and potential for further growth. However, weaknesses are evident in the smaller presence of certain industries like Leather and Webbing, indicating a need for focused support and development initiatives to bolster their growth. Identified potential areas for development and support encompass targeted interventions for the Leather Industry, investment in infrastructure, market accessibility, and skills training programs for industries like Fabric/Textile, Food and Beverage, and Wood to stimulate job creation and economic growth. These insights emphasize the necessity for strategic policymaking to balance growth and promote sustainable development across various sectors within the Kediri Residency.

During the editing phase, we diligently scrutinized the data to ensure its quality and reliability. Subsequently, in the classification stage, we organized this data into meaningful categories for a structured analysis. The verification phase followed, during which we meticulously cross-referenced and validated the data to ascertain its accuracy and fidelity. The analysis stage was pivotal, as it unearthed significant patterns and insightful revelations within the dataset. However, the culminating stage, the conclusion, played a crucial role in summarizing the findings and insights gleaned from our exhaustive analysis.

Employing Python programming, we harnessed a dataset comprising 56 rows and 3 columns, totaling 168 data points. This dataset served as the foundation for our comprehensive insights into the local economic landscape and the potential avenues for development within Kediri Residency. The knowledge thus acquired is of paramount importance, as it can be leveraged by various stakeholders such as local governments, financial institutions, and industry players to formulate more precise and efficient strategies for fostering economic growth.

Leveraging the comprehensive data gathered from various industries in Kediri Residency, it is crucial to provide stakeholders with strategic advice for sustainable development. Presenting this data is vital, but equally important is highlighting the necessity for targeted interventions. Stakeholders should concentrate on fortifying industries such as Food and Beverage and Wood,

acknowledged for their strength while implementing customized strategies to support sectors like Leather and Webbing, which exhibit comparatively lower representation. Diversification within the region's industrial landscape is pivotal for economic stability. Stakeholders should advocate policies that foster entrepreneurship, infrastructure development, and market access to enhance untapped sector potential. Prioritizing skill development programs and infrastructure for industries like Fabric/Textile, Food and Beverage, and Wood is critical for reinforcing their role in job creation and economic advancement. These recommendations, supported by relevant data, will guide stakeholders towards creating an environment conducive to the sustainable growth of micro, small, and medium enterprises in Kediri Residency.

With an intricate understanding of the distribution and segmentation of MSMEs in Kediri Residency, targeted interventions can be implemented with precision. These interventions may encompass tailored assistance programs, specialized training initiatives, enhanced market access opportunities, or optimized financing strategies. By aligning these interventions with the specific needs and characteristics of the local MSME landscape, we can catalyze sustainable economic development and prosperity in the region.

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References

- [1] S. S. Jaswal, "Problems and prospects of micro, small & medium enterprises (MSMEs) in India," *Int. J. Innov. Res. Stud.*, vol. 3, no. 5, pp. 140–161, 2014.
- [2] M. Muchie and E. Bekele, *Promoting micro, small and medium enterprises (MSMEs) for sustainable rural Livelihood*. 2009.
- [3] J. M. Pedraza, "The micro, small, and medium-sized enterprises and its role in the economic development of a country," *Bus. Manag. Res.*, vol. 10, no. 1, p. 33, 2021.
- [4] B. Berliliana, R. Utami, and W. M. Baihaqi, "Pengaruh teknologi informasi revolusi industri 4.0 terhadap perkembangan UMKM sektor industri pengolahan," *Matrix J. Manaj. Teknol. Dan Inform.*, vol. 10, no. 3, pp. 87–93, 2020.
- [5] S. Syapsan, "The effect of service quality, innovation towards competitive advantages and sustainable economic growth: Marketing mix strategy as mediating variable," *Benchmarking An Int. J.*, vol. 26, no. 4, pp. 1336–1356, 2019.
- [6] K. Das, "SMEs in India: issues and possibilities in times of globalisation," *Asian SMEs Glob. ERIA Res. Proj. Rep.*, vol. 5, pp. 69–97, 2007.
- [7] R. U. Etuk, G. R. Etuk, and B. Michael, "Small and medium scale enterprises (SMEs) and Nigeria's economic development," *Mediterr. J. Soc. Sci.*, vol. 5, no. 7, p. 656, 2014.
- [8] I. Setiawan and S. Suprihanto, "Exploratory data analysis of crime report," *Matrix J. Manaj. Teknol. dan Inform.*, vol. 11, no. 2, pp. 71–80, 2021.
- [9] M. J. Eppler, "A comparison between concept maps, mind maps, conceptual diagrams, and visual metaphors as complementary tools for knowledge construction and sharing," *Inf. Vis.*, vol. 5, no. 3, pp. 202–210, 2006.
- [10] R. A. Becker, S. G. Eick, and A. R. Wilks, "Visualizing network data," *IEEE Trans. Vis. Comput. Graph.*, vol. 1, no. 1, pp. 16–28, 1995.
- [11] N. Gershon and W. Page, "What storytelling can do for information visualization," *Commun. ACM*, vol. 44, no. 8, pp. 31–37, 2001.
- [12] B. Fry, *Visualizing data*. "O'Reilly Media, Inc.," 2008.
- [13] J. J. Hox and H. R. Boeije, *Data collection, primary versus secondary*. Elsevier, 2005.
- [14] S. Kandel, A. Paepcke, J. M. Hellerstein, and J. Heer, "Enterprise data analysis and visualization: An interview study," *IEEE Trans. Vis. Comput. Graph.*, vol. 18, no. 12, pp. 2917–2926, 2012.

- [15] K. K. Hirji, "Exploring data mining implementation," *Commun. ACM*, vol. 44, no. 7, pp. 87–93, 2001.
- [16] T. S. Guzella and W. M. Caminhas, "A review of machine learning approaches to spam filtering," *Expert Syst. Appl.*, vol. 36, no. 7, pp. 10206–10222, 2009.
- [17] P. Isenberg, N. Elmqvist, J. Scholtz, D. Cernea, K.-L. Ma, and H. Hagen, "Collaborative visualization: Definition, challenges, and research agenda," *Inf. Vis.*, vol. 10, no. 4, pp. 310–326, 2011.