

APPLICATION OF AGGLOMERATIVE HIERARCHICAL CLUSTERING IN GROUPING TOURISM INDUSTRY SMES IN EAST JAVA

Adya Hermawati¹, Abimanyu Tuwuh Sembhodo^{2*}, Nalini Mahastuti Panunjul^{3*}

¹ Faculty of Business and Economics, Widya Gama University, Malang, Indonesia

² Faculty of Business and Economics, University of Pécs, Pécs, Hungary

³ Faculty Faculty of Science and Data Analytics, Institut Teknologi Sepuluh November, Surabaya, Indonesia

*Corresponding Author: abimanyu.academic@gmail.com

Abstract: This study addresses a significant research gap in the classification and evaluation of Small and Medium Enterprises (SMEs) within the tourism industry in East Java, specifically focusing on their marketing performance. The primary objective is to categorize these SMEs based on their marketing effectiveness, a critical factor for their competitiveness in the tourism sector. To achieve this, the research employs cluster analysis, utilizing Agglomerative Hierarchical Clustering techniques. The optimal clustering method was determined using the cophenetic correlation coefficient and cluster validation indices. Data for the analysis were collected through questionnaires, with a sample comprising 30 tourism SMEs across 11 regions in East Java, with responses from three employees per SME. The findings revealed two distinct clusters: SMEs with fairly good marketing performance and those with good marketing performance. The results suggest that while many SMEs in the tourism industry in East Java exhibit competitive marketing capabilities, there remains a subset that requires strategic improvements, particularly in spiritual marketing practices. This study's novelty lies in its approach to classifying tourism SMEs by marketing performance, providing a framework for targeted performance enhancement and industry strengthening in the region.

Keywords: SMEs, Tourism Industry, Agglomerative Hierarchical Clustering

1. Introduction

Marketing performance has an important role in determining the quality of SMEs. At this time, increasing the contribution of gross domestic product (GDP) to the tourism industry in Indonesia is very important, this is to trigger more foreign exchange earnings and provide employment opportunities for the Indonesian people (Hermawati, 2018). The contribution of gross domestic product (GDP) is one of the important things for the Indonesian tourism industry. The Indonesian tourism industry needs to increase the contribution of gross domestic product (GDP) to trigger more foreign exchange earnings and also provide employment opportunities for the Indonesian people. To date, the Indonesian tourism sector contributes about 4% of the total economy of Indonesia (Hermawati, 2018).

By 2021, the Indonesian government aims to double this figure to 8% of GDP, an ambitious target (BPS, 2019). This implies that within four years, the number of visitors needs to be doubled to around 20 million. Therefore, a strategic solution is essential for this phenomenon, considering tourist destinations as an indicator of the success of the national development program in sustainable tourism.

The tourism industry is an important factor for economic progress, contributing significantly to the country's economy, with nine percent contributing to Gross Domestic Product, as a contributing factor to foreign exchange (ONWTO, 2019). By President Joko Widodo, the

tourism industry is often referred to as the leading sector of the nation's economy. The progress of tourism generates great opportunities for the welfare of the community (Chawla & Guda, 2017). The tourism industry business opportunity has caught the government's eye (Uslu, 2015), as a priority development sector that is expected to gain a lot of foreign exchange (Gomes, et al, 2015).

The Indonesian government encourages community participation in maximizing tourist destinations through the empowerment of tourism industry SMEs (Hermawati, 2019). The added value of SMEs is the business sector that was able to survive the multidimensional crisis in 1998 and the global crisis in 2008. The existence of SMEs is an aspect of contributing to the regional and national economy as a driving force for the Indonesian economy (Halim et al, 2015). Including the tourism industry SMEs, are the largest contributor to GDP to date. So the empowerment of the tourism industry SMEs is necessary because it has a significant impact on improving the economy both individually and as a whole (Roffeei et.al, 2018). In terms of employment, the tourism industry SMEs have contributed to the field of more than 11 million people in Indonesia, so SMEs in cities and districts that are involved in the tourism industry, absolutely prepare the right marketing strategy. Meanwhile, tourism as a priority development sector is expected to gain a lot of foreign exchange (Gomes, et al, 2015). It is proven that a significant contribution is given by the Indonesian tourism sector to the welfare of the community through the National Gross Domestic Product of 92.38% (Rini & Absah, 2015). Thus, the HRM strategy and integrated marketing strategy are dominant in the implementation of achievements.

The agglomerative hierarchical cluster method starts with individual objects. So initially the number of clusters is equal to the number of objects. First, the most similar objects are grouped, and these initial groups are combined according to their resemblance. Finally, as the similarity decreases, all subgroups are combined into a single cluster.

2. Literature Review

Systematic Literature Review

Systematic Literature Review (SLR) is a research method used to identify, evaluate, and synthesize relevant research on a specific topic. This process involves systematic and structured steps to ensure that the literature review is conducted thoroughly and unbiased. The method of determining variables is carried out through a Systematic Literature Review (SLR) using VOSviewer, which systematically reviews existing literature to determine relevant variables. VOSviewer is used to visualize and analyze data from the literature that has been reviewed. VOSviewer is a software tool that allows users to create visual maps of keywords, concepts, or authors in academic literature. These tools help in identifying relationships and patterns in the data, such as the emergence of frequently used keywords or interconnected concepts. Figure 1 shows the results of an analysis using VOSviewer that illustrates interrelated keywords in the tourism industry.

Spiritual Marketing

Spiritualism is a philosophy that emphasizes moral and spiritual aspects while disregarding material aspects in human life (Afzalur, 1995). Meanwhile, marketing is the process of planning and executing the concepts of pricing, promoting, and distributing ideas, goods, and services to create exchanges that satisfy the goals of individuals and organizations (Carl, 2001). Spiritual Marketing is the most appropriate type of marketing used in marketing company values (Fernandes & Rinaldo, 2018). Spiritual marketing is good to apply to companies that have high business ethics to achieve competitive advantage. In the future, business spirituality will become a source of competitiveness, because business ethics, especially honesty, are often not paid attention to. This is also what often happens to the Tourism Industry in East Java (Rini & Absah, 2015).

Based on previous research conducted by Triana Setiyarini (2007), in her journal titled "Spiritual Marketing as a Strategy to Win Competition Through Spiritual Communities," she defines the strategy of spiritual marketing as a marketing strategy that leverages the spiritual values prevalent in society to forge a closer bond between producers and consumers with the brands they use. It is through these symbols of spiritualism that a spiritual connection between the product and its consumers is fostered, leading to long-term relationships (loyalty).

A broader understanding of spiritual marketing is that the meaning of spirituality here is not always related to religion or religiosity but also encompasses social and artificial activities. The desire to share experiences or help disadvantaged communities is also included in the spiritual aspects of humans. This need is then translated by marketers into "cause-related marketing," where a portion of the funds from each purchase made by consumers is used for social activities. The benefits of cause-related marketing for companies (Shimp, 2003) are:

1. Enhancing the company's or brand's image
2. Preventing negative publicity
3. Generating additional sales
4. Increasing brand awareness
5. Expanding the customer base

Implementing spiritual values in marketing is anticipated to attract the rational market, which will, in turn, boost customer trust and eventually lead to higher satisfaction and loyalty. In the realm of spiritual marketing, businesses aim not just for profit but also for blessings in transactions by embracing the concept of *maslahah*, or welfare, thereby aligning the company with Sharia principles (Kalimah & Fadilah, 2017).

Innovation Culture

Most of the innovation culture is influenced by strategic human resource management and organizational ownership influences (Uslu, 2015). In their research, Gomes et al. discuss the factors that influence the culture of innovation, namely organizational structure and flexibility (Gomes, et al, 2015). It can be seen that the impact of innovation culture on innovation performance is proven by Halim et al., however, this research places performance as a dependent variable in the perspective of the innovation performance of Small and Medium Enterprises (SMEs) in Malaysia (Halim et.al, 2015). In the education sector, Roffeei et al. found that the culture of innovation that exists in universities can have a positive effect on the innovative behavior of students (Roffeei et.al, 2018). Therefore, research that takes the topic of innovation culture focuses more on efforts to explain the factors that shape innovation culture, and also its impact on innovation performance (Fernandes, 2017).

Most companies have automatically innovation cultures in which various norms, values, assumptions, and beliefs all compete for influence over employees' actual behavior. The dominant ones that win out finally form the culture. Innovation culture can be determined as a multi-dimensional context which involves the intention to be innovative, the infrastructure to maintain innovation, operational level behaviors necessary to influence a market and value orientation, and the environment to implement innovation (Dobni, 2008). According to (Ahmed, 1998), a principal determinant of innovation is culture. The hold of positive cultural characteristics equips the organization with essential ingredients to innovate. Active organizations can absorb innovation into the organizational culture and management processes of the organization. Culture has various elements which can serve to enhance or inhibit the tendency to innovate.

Analysis results support the belief that the essential feature of organizational culture which supports for innovation is the role and attitude demonstrated by senior managers and their willingness to monitoring the firm's progress in innovation-led activities (March-Chorda, 2008). A significant finding from this research shows that decision-makers do not need to be overly concerned with keeping a loose corporate structure. A significant degree of bureaucracy linked to a strict structure does not indeed inhibit innovation. Actually, for large multinational companies with subsidiaries, an innovation culture can be formed despite the prevalence of a particular level of rigidity, bureaucracy and hierarchical organizational structure.

Quality of Work Life

The quality of work life is one thing that must be considered for organizations that are still trying to retain their employees. Quality of Work Life (QWL) is a comprehensive program that is involved in increasing employee satisfaction, learning efficiency in the workplace, and helping employees manage change and transition for the better (Hermawati, 2017). The existence of dissatisfaction with the quality of work will harm almost all workers regardless of their status or position (Osorio Tinoco et. al, 2019). The concept of quality of work life is a term that includes various aspects such as work ethics, working conditions, measures of working conditions, employee satisfaction, and production efficiency (Darmawan and Mardikaningsih, 2021). Quality of work life plays an important role in improving the quality of life of employees (Retnowati, et al. 2023).

Quality of work life is important for organizations because it is considered capable of increasing employee participation in them (Retnowati, et al. 2023). Quality of work life among workers ensures their sustainability as members of the company. The quality of employees' work life contributes to the level of satisfaction they feel both at work and with the job itself (Hariani and Sinambela, 2021).

Good quality of work life must be supported by leaders who understand the interests of employees, because leaders have an important role in improving abilities, commitment, skills, understanding of organizational values, and teamwork to achieve work performance in the organization (Darmawan and Mardikaningsih, 2021). Effective leadership sets goals in company policy, provides extensive career development opportunities for employees, recognizes their efforts, and creates a comfortable and conducive work environment (Retnowati, et al. 2023). Apart from the quality of work life and leadership, perceptions of organizational support also play a role in strengthening organizational commitment (Darmawan and Mardikaningsih, 2021).

Rewards

Reward is one of the methods to motivate someone to do good and improve performance. Awards are a form of appreciation for achievements, both in the form of material and speech, which are given for success or achievement (Andreyan, et al. 2020). Awards are compensation given by companies to employees because they have contributed their energy and thoughts for the progress of the company and the achievement of predetermined goals (Bakti, 2022).

Rewards can be interpreted as a gift received by employees as remuneration for their achievements to the company in carrying out their work. Economic rewards are usually given in the form of salaries, wages, allowances, bonuses, incentives, and others. According to experts, rewards can be divided into 2 groups, namely intrinsic rewards and extrinsic rewards. Intrinsic rewards are rewards that come from the employees themselves such as task completion, achievement, autonomy, and personal development. While extrinsic rewards are rewards that come from outside the employee such as salaries and benefits, interpersonal (status and recognition), and promotions (Gibson et al, 1982). Reward has several main indicators, including wages, incentives, and benefits (Andreyan, et al. 2020). The combination of these three indicators serves as an effective motivation to improve employee performance and commitment to the company.

The purpose of giving rewards by companies to employees includes attracting, motivating, developing, satisfying, and maintaining human resources (HR) (Andreyan, et al. 2020). Rewards help companies attract qualified candidates and develop their skills and competencies. In addition, rewards also serve to satisfy employees, ensuring they feel valued and treated fairly, so they remain committed and loyal to the company. Rewards also have other benefits, namely providing information about the importance of a particular achievement or contribution that is valued (Bakti, 2022). Thus, rewards not only improve employee welfare, but also communicate company values and expectations of desired performance.

Market Orientation

Market orientation is defined as an organizational culture that requires all elements within the company to continuously obtain information about customer needs, both current and potential future needs (Rombon et al., 2018). The extent to which the company creates satisfaction can be measured from a market orientation that can be maximized by meeting customer needs and desires as an organizing principle in the company (Hermawati, 2011). Strengthening market orientation not only improves company performance through increased customer satisfaction but also enhances employees' organizational commitment. By proactively understanding and anticipating customer needs, the company can develop more effective and relevant strategies, which in turn strengthens relationships with customers and boosts loyalty. Additionally, when employees see that the company is focused on meeting customer needs, they tend to feel more engaged and motivated, leading to a stronger commitment to the organization's goals and values.

Market orientation has the characteristics of being very valuable, rare, and non-exchangeable, and cannot be perfectly imitated, assessed as one of the internal capabilities and resources that have the potential to create a competitive advantage (Zhou et.al, 2015). This combination makes market orientation a key factor in achieving sustainable competitive advantage. The unique attributes of market orientation, including its inherent value and the difficulty of replicating it, position it as a crucial component in fostering a company's long-term success and differentiation in the marketplace.

Market orientation has two main approaches, namely the MARKOR scale and the MKTOR scale. The MARKOR scale (Kohli and Jaworski, 1990) emphasizes the collection, dissemination, and response to market intelligence related to current and future customer needs. The MKTOR scale (Narver and Slater, 1990) focuses on customer orientation, competitor orientation, and inter-functional coordination. By utilizing both approaches, companies can develop more effective strategies to achieve sustainable competitive advantage.

Individual Performance

Individual performance is the result of the actions and contributions of an employee that play a crucial role in the success of a company by meeting or exceeding established performance standards (Faritsi et al., 2024). Individual performance is the result of work in quality and quantity that has been achieved by individuals in carrying out their duties under the responsibilities given to them (Sengupta et al, 2013). According to experts, the achievement of individual performance is related to the achievement of a series of individual tasks with the support of existing information technology (Sianggaran, 2017). Each employee strives to give their best, demonstrating dedication and competence in every task performed, thus their contributions directly support the achievement of the company's goals and targets. By meeting or even exceeding expectations, employees not only help achieve operational efficiency but also strengthen the company's position in facing market competition.

According to S. Mishra et al. (2020), dimensions of individual performance are categorized based on the following levels: (a) At the organizational level, performance is influenced by organizational culture, which impacts work relationships and work-life balance, and consequently affects company decisions on promotions, transfers, and compensation; (b) At the managerial level, performance is shaped by role and job design dimensions, which influence aspects such as worker transparency in task completion, equal opportunities for advancement, and behavior in project leadership; (c) At the individual level, performance is determined by factors such as knowledge, skills, work ethics, and is further affected by personal and health issues that can influence overall work performance.

The factors influencing individual performance are divided into three categories: (a) Firm/environment-related factors, which affect individual performance through the organizational climate and the dynamic nature of the company's environment; (b) Employee-related factors, which involve the collaboration between workers and are influenced by each individual's ability to adapt and their work-related skills; (c) Job-related factors, which drive individuals to deliver optimal performance through the automation of tasks, thereby enhancing efficiency and productivity ((Diamantidis & Chatzoglou, 2019).

Marketing Performance

Business performance is measured from various aspects, one of which is marketing performance. A company can improve if the company can choose and implement the right approach (Angelica & Pratiwi). Marketing performance is generally used to measure the impact of a company's strategy. Theoretically, there are many ways to achieve and sustain marketing performance. One of them states that by being customer and competitor oriented, a company will be able to improve its performance (Ullah, 2020). Oriented to customers and competitors is one form of method that can be used if the company wants to excel in the competition (Sumardi & Fernandes, 2020).

Good marketing performance is measured by increased sales from previous years and higher growth than competitors, as well as having a wider market share than in previous years

(Hermawati, 2018). Meanwhile, poor marketing performance is indicated by declining sales, declining sales compared to the previous year as well as competitors in the same industry, and decreasing market share.

Marketing performance is often measured through revenue levels. Research shows that improved marketing performance can be significantly influenced by entrepreneurial orientation and product innovation. For example, in a study conducted by Fatmawati et al. (2016), income level was used as one of the marketing performance indicators.

Product innovation also has an important role in improving marketing performance. Research shows that product innovation has a positive effect on marketing performance. For example, in a study conducted by Priatin et al. (2017), product innovation was found to have a significant influence on the marketing performance of UMKM.

Market orientation is a corporate culture that leads to improved marketing performance. Companies that have a strong market orientation can better understand customer wants and needs, thereby increasing customer commitment and customer value creation. For example, in a study conducted by Solikahan & Mohammad (2019), market orientation was applied to the marketing system to improve the business performance of UMKM.

Competitive Advantage

Competitive advantage is something that is dynamic and cannot be maintained (Syafar, 2004). This is because today's competition and tomorrow's competition must be viewed as competition with high dynamics and not something static that requires the right strategy (Purbawangsa et al., 2019). Competitive advantage can be interpreted as an advantage over competitors that is obtained by obtaining a larger number of customers, through lower prices, or by providing more benefits under higher prices (Kotler, 2002). A competitive advantage is a tool for achieving organizational financial goals to achieve success over its competitors (Fernandes & Taba, 2018).

Competitive advantage is the ability of a company to maintain and improve its position in the market through strategies and activities that are unique and better than its competitors. The definition of competitive advantage can be seen as the company's ability to do certain things better than its competitors. For example, in research conducted by Adiputra & Mandala (2017), competitive advantage is defined as the company's ability to achieve competitive advantage through corporate transformation, competence, and innovative behavior.

Factors such as market orientation, product innovation, and the use of information technology can shape competitive advantage. For example, in a study conducted by Fatmawati et al. (2016), market orientation and product innovation were found to have a real role in shaping competitive advantage. Market orientation and product innovation strategies can help companies increase competitive advantage. For example, in research conducted by Hasan et al. (2021), the development of MSME competitive advantage through market orientation strategies and product innovation was found to be effective in improving company performance.

Competitive advantage can have a positive effect on company performance. For example, in a study conducted by Priatin et al. (2017), innovative behavior was found to have a significant effect on competitive advantage, which in turn improves firm performance. Thus, competitive advantage is the result of unique and better strategies and activities than competitors, which can help a firm maintain and improve its position in the market.

Cluster Analysis

Clustering is the process of creating groupings so that all members of each partition have similarities based on a certain matrix (Johra, 2021). Cluster analysis or group analysis is a data analysis technique that aims to group individuals or objects into several groups that have different properties between groups, so that individuals or objects located in one group will have relatively homogeneous properties. The purpose of cluster analysis is to group objects. In cluster analysis, some assumptions must be met, namely the assumption of non-multicollinearity. Non-multicollinearity means the absence of multicollinearity in the data used. Multicollinearity is a situation where there is a correlation or linear relationship between the independent variables among each other so that the independent variables are not orthogonal (Wasilaine et al., 2014). Another definition states that if there is multicollinearity, it means that the variables are interconnected and not free.

Agglomerative Hierarchical Clustering (AHC)

The Analytical Hierarchy Process is a statistical analysis that produces an agglomerative form of hierarchical grouping, which is a hierarchical grouping method with a bottom-up approach (Fernandes, 2019). The grouping process starts from each data as a group, then recursively looks for the closest group as a pair to join as a large group (Fernandes, 2014). The process is repeated continuously so that it seems to move upwards to form a hierarchy (hierarchy). This method requires a cluster proximity parameter.

Average Linkage

Average linkage treats the distance between two clusters as the average distance between all pairs of items in which one member of the pair belongs to each cluster. Start by looking for the distance matrix to get the closest (most similar) objects such as U and V (Fernandes, 2017). These objects are combined to form a cluster (UV). Algorithm the distances between (UV) and other W clusters are determined by $D = \{d_{ik}\}$

$$d_{((UV)W)} = \frac{(\sum_i \sum_k d_{ik})}{(N_{((UV))} \sum N_{_W})}$$

where is the distance between object i in the cluster (UV) and object k in cluster W, and are the number of items in the cluster (UV) and W, respectively $d_i d_{_N_{UV}} N_{_w}$

3. Method

Data analysis was conducted quantitatively using the Agglomerative Hierarchical Clustering method with Average Linkage. The data were obtained from questionnaires distributed to 30 SMEs in 11 regions in East Java, with 3 employees from each SME as respondents. The cluster analysis began by determining the best linkage using the cophenetic correlation coefficient and various cluster validation indices (Silhouette, Dunn, and Connectivity indices). The analysis was conducted using R software.

4. Results and Discussion

Determination of Best Linkage

Determination of the cluster linkage to be used, can be seen from the cophenetic correlation coefficient, where the higher the cophenetic correlation coefficient, the better the linkage is to be used.

Table 1. Cophenetic Correlation Coefficient of Each Linkage

Linkages	Cophenetic Correlation Coefficient
Average	0.69
Single	0.53
Ward	0.67
Completed	0.59
Centroid	0.66

Based on the results of the cophenetic correlation coefficient in Table 1, it can be seen that the value for the highest cluster result or close to 1 is the Average Linkage method which is worth 0.69. Thus, the Average Linkage method is the best cluster method to be used in cluster analysis.

Determination of Optimal Number of Clusters

The first step to get the appropriate number of clusters is to look at the validity index, namely the Connectivity index, Dunn index, and Silhouette index.

Table 2. Cluster Validation Measurement Results

Validity Index	Many Clusters			
	2	3	4	5
Connectivity	3.05	12.69	23.77	26.36
Dunn	0.413	0.334	0.289	0.289
Silhouettes	0.266	0.209	0.194	0.171

Based on Table 2, many optimal clusters are selected on the connectivity index based on the smallest index value, so many optimal clusters are selected as many as two clusters. In the Dunn index, many optimal clusters are selected based on the largest index value, so many optimal clusters are selected based on the Dunn index as many as two clusters. In the Silhouette index, many optimal clusters are selected based on the largest index value, so many optimal clusters are selected based on the Silhouette index as many as two clusters. So it can be concluded that the optimal number of clusters formed is two clusters.

Cluster Analysis

The analysis of the cluster formed can be seen in the dendrogram below.

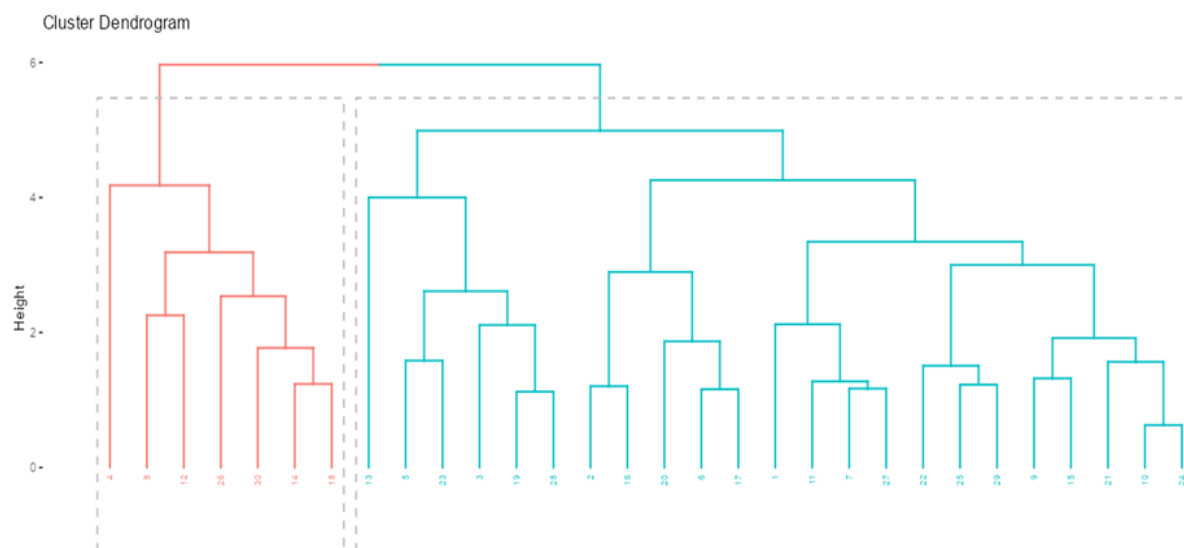


Figure 1: Dendrogram

The visualization results with the dendrogram show that two clusters were formed. In Figure 1, cluster one is visualized in blue while cluster two is visualized in red.

Table 3. Number of Members and Cluster Members

Clusters	Many Members	Percentage	Member
1	23	76.6%	1,2,3,5,6,7,9,10,11,13,15,16,17,19,20,21,22,23,24,25,27,28,29
2	7	23.4%	4,8,12,14,18,26,30

Based on the results of cluster analysis, cluster 1 has 23 MSME members with a percentage of 76.6%, while cluster 2 has 7 MSME members in the East Java Region.

Table 4. Average Variables for each East Java UKM Cluster

Variable	Cluster 1 (Medium)	Cluster 2 (High)
Spiritual Marketing	3,283	3,863
Innovation Culture	3,502	3,730
Quality of work life	3,441	3,614
Rewards	3,454	3,690
Individual Performance	3,343	3,857
Total average	3,405	3,751

The average for each cluster in Table 5 shows that SMEs in the tourism industry in East Java in cluster 1, namely 76.6%, have quite good Spiritual Marketing, Culture of Innovation, Quality of work life, Rewards, and Individual Performance. Meanwhile, 23.4% of SMEs in the tourism industry in East Java in cluster 2 have good Spiritual Marketing, Innovation Culture, Quality of work life, Rewards and Individual Performance.

The total average of each cluster in Table 4 shows that clusters 1 and 2 have an average total score that is classified as medium and high, namely 3.41 and 3.75 out of 5 points. This means

that the majority of SMEs in the tourism industry in East Java already have good spiritual marketing, innovation culture, quality of work life, rewards, and individual performance. However, the average total score in cluster 2 is greater than the average total score in cluster 1 which shows that MSMEs in cluster 2 have better Spiritual Marketing, Innovation Culture, Quality of work life, Rewards, and Individual Performance than MSMEs in cluster 1.

Discussion

The tourism industry plays a very important role in the Indonesian economy. As one of the main sectors contributing to the country's foreign exchange, tourism creates jobs for Indonesian people in various fields, including the hotel industry, transportation, culinary, and Micro, Small, and Medium Enterprises (MSMEs). Tourism also helps in preserving culture and the environment due to the increasing awareness of the importance of preserving cultural and natural heritage to attract tourists. With diverse natural and cultural potential, Indonesia has a competitive advantage in the global tourism market. Therefore, the development and promotion of sustainable tourism is key to increasing the contribution of this sector to the national economy and the welfare of society as a whole.

The use of the Agglomerative Hierarchical Clustering method in grouping Micro, Small, and Medium Enterprises (MSMEs) in the East Java tourism sector provides important insights into the dynamics and characteristics of various MSME groups. In this study, the variables analyzed include spiritual marketing, innovation culture, quality of work life, rewards, and individual performance. Spiritual marketing reflects the application of religious and ethical values in MSME marketing strategies. Innovation culture indicates the level of adoption of new and creative approaches in MSME operations. Quality of work life encompasses employee well-being and job satisfaction. Rewards refer to the compensation given to employees, while individual performance measures the productivity and contribution of each individual within the MSME.

By using Agglomerative Hierarchical Clustering, MSMEs in the tourism sector can be grouped based on similar characteristics in these five variables. The grouping results show that there are groups of MSMEs with a strong spiritual marketing approach, an advanced innovation culture, a good quality of work life, a fair reward system, and high individual performance. This grouping allows MSME managers to identify and understand the strengths and weaknesses in each group, enabling them to design more effective strategies to improve the performance and competitiveness of MSMEs in the tourism sector.

An in-depth analysis of each MSME group can provide an understanding of the factors that most influence individual performance. This research can also identify the relationship between the quality of work life and the level of employee satisfaction with individual performance, as well as how a fair reward system can increase employee motivation and productivity.

The results of this research have practical implications for the development of MSMEs in the East Java tourism industry. MSME managers can utilize these findings to design training and development programs tailored to the specific needs of each group. In addition, local governments and related institutions can use this information to formulate policies that support strengthening the culture of innovation, improving the quality of work life, and creating a more competitive reward system among MSMEs. Thus, the application of Agglomerative Hierarchical Clustering not only provides a comprehensive picture of MSME groupings but also aids in strategic planning to improve the performance and competitiveness of the tourism sector in East Java.

5. Conclusions

The conclusions from the results of this research are (1) Based on the cluster analysis carried out, the chopenetic linkage coefficient used is the average linkage with an optimal cluster of 2 clusters and based on the validation results using the Dunn, Connectivity, and Silhouette indices. Two clusters were formed with cluster 1 members being 23 Tourism Industry SMEs, namely 76.6%, and cluster 2 with 7 Tourism Industry SMEs, namely 23.4%; (2) The Tourism Industry SME group based on marketing performance is grouped into 2 clusters, namely the fairly good and good groups. This shows that the SME Tourism Industry in East Java already has a marketing performance that can compete with other tourism industries at home and abroad. However, for the SME group with marketing performance at a fairly good level, improvements need to be made, especially regarding spiritual marketing.

Acknowledgements

The authors realize that this paper would not have been successful without the help of various parties. Therefore, the author would like to thank God and all family members who have supported the author to complete this paper.

Declaration of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- A, Shimp, Terence .2003. Periklanan Promosi & Aspek Tambahan Komunikasi Pemasaran Terpadu, Jilid I (edisi 5), Jakarta :Erlangga.
- Adiputra, A., & Mandala, R. (2017). Keunggulan Kompetitif Perusahaan dalam Menghadapi Persaingan Pasar. *Jurnal Manajemen dan Bisnis*, 10(2), 1-10.
- Angelica, TK, & Pratiwi, R. Analysis of factors that influence individual performance in using accounting information systems with user satisfaction as an intervening variable (Case Study of Small and Medium Enterprises Typical Food in Palembang).
- Afzalur Rahman. Doktrin Ekonomi Islam. Bandung: PT. Dana Bhakti Wakaf. 1995.
- Apriyanti, R., Bahrin, K., & Finthariasari, M. 2020. Pengaruh Kepemimpinan, Reward dan Punishment terhadap Kinerja Karyawan (Studi Kasus pada PT. K3/SIL Ketahun Bengkulu Utara). *Jurnal Entrepreneur dan Manajemen Sains (JEMS)*, Vol. 1 No. 2, pp. 189-194.
- Bakti, D. W. (2022). Faktor-Faktor yang Mempengaruhi Kinerja Pegawai: Pola Mutasi, Penghargaan dan Lingkungan Kerja (Literature Review Manajemen Sumber Daya Manusia). *Jurnal Ilmu Hukum Humaniora dan Politik (JIHHP)*, Vol. 2 No. 1, pp. 41-50.
- BPS. (2019). "<https://www.bps.go.id/publication/2019/07/04/daac1ba18cae1e90706ee58a/>".
- C. B. Dobni: Measuring innovation culture in organizations: The development of a generalized innovation culture construct using exploratory factor analysis. *European Journal of Innovation Management*. Vol. 11 No. 4 (2008), p. 539-559.
- Carl McDaniel and Roger Gates, *Contemporary Marketing Research*, Terj. Sumiyarto dan Rambat Lupiyoadi, "Riset Pemasaran Kontemporer", Jakarta: Salemba Empat, 2001, hlm. 5
- Chawla, V., & Guda, S. (2017). Salesperson's spirituality: impact on customer orientation and adaptability. *Marketing Intelligence & Planning*.

- Darmawan, D., Mardikaningsih, R. (2021). Studi tentang Peran Kualitas Kehidupan Kerja, Kepemimpinan dan Persepsi Dukungan Organisasi Terhadap Komitmen Organisasi. *Jurnal Simki Economic*, Vol. 4 No. 1, pp. 89-98.
- Diamantidis, A. D., & Chatzoglou, P. (2019). Factors affecting employee performance: an empirical approach. *International Journal of Productivity and Performance Management*, 68(1), 171–193.
- Faritsi, V. N., Emilisa, N., & Tiarapuspa. (2024). Effect of Electronic Performance Monitoring, Leadership, and Trust. *JURNAL MANAJEMEN DAN PERBANKAN (JUMPA)*, 11(1), 50-67.
- Fatmawati, R. A., Pradhanawati, A., & Ngatno. (2016). Pengaruh Orientasi Pasar, Orientasi Kewirausahaan Terhadap Keunggulan Bersaing dan Kinerja Pemasaran Pada Warung Angkringan Kota Semarang. *Jurnal Ilmu Administrasi Bisnis*, 5(3), 351–362.
- Fatmawati, A., Sari, D. P., & Sari, D. P. (2016). Pengaruh Orientasi Pasar dan Inovasi Produk terhadap Keunggulan Kompetitif. *Jurnal Ekonomi dan Bisnis*, 9(1), 1-12.
- Fernandes, AAR (2017). Investigation of instrument validity: Investigate the consistency between criterion and unidimensional in instrument validity (case study in management research). *International journal of law and management*.
- Fernandes, AAR (2017). Moderating effects orientation and innovation strategy on the effects of uncertainty on the performance of business environment. *International Journal of Law and Management*.
- Fernandes, S., & Rinaldo, AARAA (2018). The mediating effect of service quality and organizational commitment on the effect of management process alignment on higher education performance in Makassar, Indonesia. *Journal of Organizational Change Management*.
- Fernandes, AAR, & Taba, I.M. (2018). Welding technology as the moderating variable in the relationship between government policy and quality of human resources and workforce competitiveness. *Journal of Science and Technology Policy Management*.
- Fernandes, AAR, Budiantara, INI, Otok, BW, & Suhartono. (2014). Reproducing Kernel Hilbert space for penalized regression multi-predictors: Case in longitudinal data. *International Journal of Mathematical Analysis*, 8(40), 1951-1961.
- Fernandes, AAR, Hutahayan, B., Arisoesilansih, E., Yanti, I., Astuti, AB, & Amaliana, L. (2019, June). Comparison of curve estimation of the smoothing spline nonparametric function path based on PLS and PWLS in various levels of heteroscedasticity. In *IOP Conference Series: Materials Science and Engineering* (Vol. 546, No. 5, pp. 052024). IOP Publishing.
- Gibson, James L. et.al. (1982). *Organizations, Behavior, Structure, Processes*. 4th ed, Richard D. Irwin Inc.
- Gomes, G., Machado, DDPN, & Alegre, J. (2015). Determinants of innovation culture: A study of textile industry in Santa Catarina. *Brazilian Business Review*, Vol. 12 No. 4, pp. 99-122.
- Hasan, A., Sari, D. P., & Sari, D. P. (2021). Strategi Orientasi Pasar dan Inovasi Produk dalam Meningkatkan Keunggulan Kompetitif UMKM. *Jurnal Manajemen dan Bisnis*, 14(1), 1-10.
- Halim, HA, Ahmad, NH, Ramayah, T., Hanifah, H., Taghizadeh, SK, & Mohamad, MN (2015). Towards an innovation culture: Enhancing innovative performance of Malaysian SMEs. *Academic Journal of Interdisciplinary Studies*, Vol. 4 No. 2, pp. 85.

- Hariani, M., Sinambela, E. A. (2021). Hubungan Kualitas Kehidupan Kerja, Kepuasan Kerja, dan Integritas Akuntan Publik. *Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)*, Vol. 3 No 2, pp. 297-301.
- Hermawati, A. (2011). Quality of Work Life, Organizational Trust and Job Satisfaction Mediate Psychological Empowerment on Organizational Commitment in Private Universities in East Java. Dissertation. Faculty of Economics. Brawijaya University. Poor.
- Hermawati, A., & Puji Suci, R. (2017). Cooperative Performance Development Strategy Using a Hierarchical Process Analytical Approach. Call For Paper SANSETMAB.
- Hermawati, A. (2018). Marketing performance with good sales growth, higher growth than competitors. *International Letters of Social and Humanistic Sciences*, Vol. 52, pp. 95-103.
- Hermawati, A. (2019). Quality of Work Life, Job Involvement, and Organizational Citizenship Behavior in the Relationship between Transglobal Leadership to Employee Performance.
- I. S. I. D. R. E. March-Chorda, and J. E. F. F. Moser: How organisational culture affects innovation in large sized ict firms: a pilot study. *Recuperado el*, Vol 30 (2008)
- Johra, M.B. (2021). Soft Clustering Using the Fuzzy K-Means Algorithm (Case Study: Village Grouping in the City of Tidore Islands). *BAREKENG: Journal of Mathematical and Applied Sciences*, 15(2), 385-392.
- Kalimah, S., & Nur Fadilah. (2017). Marketing Syariah: Hubungan Antara Agama dan Ekonomi. Banyuwangi: LPPM Institut Agama Islam Ibrahimy Genteng Banyuwangi.
- Kohli, Ajay. K and Jaworski, Bernard. J, 1990, "Market Orientation: The Construct, Research Propositions, and Managerial Implications", *Journal of Marketing*, Vol. 54, April.
- Kotler, Philip, (2003), "Marketing management", 11th edition/ International Edition. Prentice Hall. New Jersey.
- Mishra, S., Singh, S., & Tripathy, P. (2020). Linkage Between Employee Satisfaction and Employee Performance: A Case in Banking Industry. *Global Business Review*, May 2021.
- Narver, J. and Slater, S., 1990, The effect of a market orientation on business profitability. *Journal of Marketing*, Vol. 54.No 10.Page: 20-35.
- Pratama, M. F. A., & Handayani, W. P. P. (2022). Pengaruh Reward dan Punishment terhadap Kinerja Karyawan. *Decicion: Jurnal Sosial Ekonomi Bisnis*, Vol. 2 No. 2, pp. 62-70.
- Priatin, A., Sari, D. P., & Sari, D. P. (2017). Perilaku Inovatif dan Keunggulan Kompetitif Perusahaan. *Jurnal Ekonomi dan Bisnis*, 10(2), 1-10.
- P. K. Ahmed: Culture and climate for innovation. *European journal of innovation management*. Vol. 1 No.1 (1998), p. 30-43
- Priatin, Y., Surya, D., & Suhendra, I. (2017). Pengaruh Optimasi Pasar dan Orientasi Kewirausahaan Terhadap Kinerja Pemasaran dengan Inovasi Produk Sebagai Variabel Intervening (Studi pada Kelompok Usaha Bersama (KUB) Gerabah di Desa Bumi Jaya Kecamatan Ciruas Kabupaten Serang). *Jurnal Riset Bisnis Dan Manajemen Tirtayasa (JRBMT)*, 1(1), 81–96. <https://doi.org/10.48181/jrbmt.v1i1.2609>
- Purbawangsa, IBA, Solimun, S., Fernandes, AAR, & Rahayu, SM (2019). Corporate governance, corporate profitability toward corporate social responsibility disclosure and corporate value (comparative study in Indonesia, China and India stock exchange in 2013-2016). *Social Responsibility Journal*, Vol.16 No.7, pp. 983-999.

- Retnowati, E., Darmawan, D., Putra, A. R., Putra, R. S., & Issalillah, F. (2023). Pengaruh Modal Psikologis, Kualitas Kehidupan Kerja, dan Kepemimpinan Terhadap Kinerja Pegawai. *Jurnal Baruna Horizon*, Vol. 6 No. 1, pp. 31-38.
- Rini, ES, & Absah, Y. (2015). Analysis of loyalty creation through the influence of implementing rational, emotional and spiritual marketing strategies on PT customer satisfaction. Bank Sumut Syariah Medan Main Branch. *Journal of Management and Business Studies*, Vol. 2 No. 1, pp. 63-76.
- Roffeei, SHM, Yusop, FD, & Kamarulzaman, Y. (2018). Determinants of Innovation Culture among Higher Education Students. *Turkish Online Journal of Educational Technology-TOJET*, Vol. 17 No. 1, pp. 37-50.
- Rombon, A. R., Rengkung, L. R., & Tatu, J. (2018). Market Orientation Pada PT Gunung Hijau Masarang Berdasarkan Skala Markor. *Agri-SosioEkonomi Unsrat*, 14(2), 255-270.
- Sengupta, A., Venkatesh, D.N., & K. Sinha, A. (2013). Developing performance-linked competency model: a tool for competitive advantage. *International Journal of Organizational Analysis*, Vol. 21 No. 4, pp. 504-527.
- Sianggaran, R. (2017). Strengthening Marketing Performance Through Developing Innovation and Creativity Work Programs for Young Entrepreneurs in Semarang. *Indonesian Journal of Marketing Science (Indonesian Journal of Marketing Science)*, Vol. 16 No. 1, pp. 26-42.
- Solikahan, E. Z., & Mohammad, A. A. (2019). Entrepreneurial Orientation, Market Orientation and Financial Orientation in Supporting the Performance of Karawo SMEs in Gorontalo City. *Journal of Applied Management*, 17(4), 729-740.
- Sumardi, S., & Fernandes, AAR (2020). The influence of quality management on organizational performance: service quality and product characteristics as a medium. *Property Management*, Vol. 38 No. 3, pp. 383-403.
- Syafar, AW (2004). Building Regional Competitiveness Through Distinctive Competencies Based on Superior Commodities.
- Triana, Setiyarini, Pemasaran Spiritual Sebagai Strategi Memenangkan Persaingan Melalui Komunitas Spiritual, dalam *Jurnal Studi Manajemen*, Vol. 3, No. 2 Oktober 2007
- Ullah, Z., Ahmad, N., & Naheed, R. (2020). The missing link of organizational citizenship behavior between workplace spirituality and job performance. *Journal of Xi'an University of Architecture & Technology*, XII.
- Uslu, T. (2015). Innovation culture and strategic human resource management in public and private sectors within the framework of employee ownership. *Procedia-Social and Behavioral Sciences*, Vol. 195, pp. 1463-1470.
- ONWTO, (2019).
["https://www.bps.go.id/publication/2019/07/04/daac1ba18cae1e90706ee58a/"](https://www.bps.go.id/publication/2019/07/04/daac1ba18cae1e90706ee58a/).
- Osorio Tinoco, F.F., Hernández-Espallardo, M., & Rodríguez-Orejuela, A. (2020). Nonlinear and complementary effects of responsive and proactive market orientation on firms' competitive advantage. *Asia Pacific Journal of Marketing and Logistics*, Vol. 32 No. 4, pp. 841-859.
- Walpole, R. E. (1993). *Introduction to Statistics 3rd Edition*. Jakarta: PT. Gramedia Pustaka Utama.
- Wasilaine, TL, Talakua, MW & Lesnussa, YA (2014). Ridge Regression Model to Overcome Multiple Linear Regression Models Containing Multicollinearity (Case Study: Baby Growth Data in Namaelo RT 001 Subdistrict, Masohi City). *Barekeng Journal*, 8(1), 31-37.

Zhou, K. Z., Li, J. J., Zhou, N., & Su, C. (2008). Market orientation, job satisfaction, product quality, and firm performance: evidence from China. Strategic management journal, Vol. 29 No. 9, pp. 985-1000.