Clustering Enumerators of 2023 Agricultural Census as an Implementation Strategy to Ensure Quality Statistical Data at BPS Blitar Regency

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Abstract. The Central Statistics Agency (BPS) employs strategic management in its organizational governance, encompassing planning, implementation, and evaluation. BPS conducted the 2023 Agricultural Census as mandated by law, involving statistical partners as field data collectors. The diverse characteristics of census officers underscore the necessity for effective and efficient resource management to foster the availability of quality statistical data. However, the process of monitoring and managing census officers has overlooked factors such as academic training characteristics, attitude and behavior values, and age considerations. Thus, the purpose of the study is to address challenges in human resource management within the Central Statistics Agency (BPS) in the context of conducting the 2023 Agricultural Census. The research employs a quantitative approach, specifically utilizing cluster analysis to group census officers for the 2023 Agricultural Census in Blitar Regency. Secondary data on training grades, including task grades, in-depth grades, and age, are utilized for this purpose. The cluster analysis results revealed two main groupings representing census officers for the 2023 Agricultural Census in Blitar Regency. The study concludes that strategic management and human resource management play crucial roles in achieving BPS's vision of providing quality statistical data for national development.

Keywords: implementation strategies, academic training values, attitude and behavior values, clustering

1 Introduction

The Central Statistics Agency (BPS) has implemented strategic management in establishing the organization's vision as a provider of quality statistical data for advanced Indonesia. This vision is stated in the BPS strategic plan document for 2020-2024. With this vision, BPS emphasizes its existence to provide quality statistical data as accurate statistical information and depicts actual conditions to support Indonesia's progress.

In strategic management, three parts of the process will be followed, namely planning strategies, implementation strategies, and controling strategies [1]. [2] explain the conventional stages in strategic management, namely planning strategies, implementation strategies, and evaluation strategies. At the planning stage, strategic analysis is carried out to determine the goals to be achieved by an organization and determine various strategic alternatives that are identified and aligned from external and internal aspects to support the achievement of organizational goals.

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Meanwhile, the implementation phase process includes activities related to functional components, strategy introduction, action plan design, organizational and resource preparation, strategy experimentation, and completion of the implementation phase. The evaluation strategy stage is an administrative practice that involves monitoring and assessing the entire implementation strategy process.

As a supporter of achieving the vision that has been set, BPS formulates missions that are relevant and can be interrelated. These missions include providing quality statistics with national and international standards, developing ministries/institutions/departments through a sustainable national statistical system, providing excellent service for the realization of a national statistical system, and building superior and adaptive human resources based on the values of professionalism, integrity, and trustworthy. Thus, this formulation becomes a process for implementing strategic management to achieve the vision set by the organization.

Several dimensions of statistical data quality include attention to relevance, accuracy, actuality and timeliness, accessibility, coherence and comparability, and interpretability. Steps and efforts to obtain quality data need to consider the presence of human resource components who have good abilities or competencies and can carry out each stage in the series of data collection activities. These efforts are made so that the quality data produced by BPS can meet the country's development needs.

At the implementation stage, BPS carries out large-scale data collection on the entire population as well as surveys as material for development planning and evaluation. The legal basis for carrying out censuses and surveys is Law Number 16 of 1997 concerning Statistics [3]. These data collections are part of basic statistical activities to provide complete, accurate, and up-to-date statistical data to create a National Statistical System that is reliable, effective, and efficient and supports national development. Census and survey activities are carried out in a structured manner at regency/city BPS throughout Indonesia.

In carrying out data collection, BPS employs officers from BPS organic employees and partners. Statistical officers carry out data collection using interviews, measurements, or other methods on statistical objects. Large-scale data collection activities always use non-organic statistical officers who have been referred to as statistical partners. These officers are human resources who carry out data collection activities in their assigned areas according to their respective domiciles.

Recruitment of partners is one of the determining factors in creating successful data collection. The qualifications of officers required to carry out data collection must be by the established criteria and the relevant data collection activities. This is intended so that officers can produce quality data that can be used to support state development. This process is a series of implementation stages in strategic management implemented by BPS to achieve the vision that has been set.

Implementation strategy is a crucial aspect that can determine the success of a company [4]. [1] concluded that implementation strategy is a part of management that has an important role in achieving prosperity and competitiveness and reflects fundamental ideas for achieving the goals of an organization. The implementation strategy is a realization of the strategy and what is done by the company [5]. [6] concluded that implementation has a big impact on the results achieved

by an organization, is related to performance, and can be influenced by organizational culture, the role of managers, and leadership style.

In implementation strategies, human resource allocation has an important role in achieving the goals that have been formulated in an organization. Implementation strategies require coordination with many human resources [7]. With human resource management, effectiveness, efficiency, and productivity will be created to achieve goals [8]. Quality human resources are expected to be able to produce quality data and be a reference for national development interests. BPS strives to develop superior and adaptive human resources through professional values, integrity, and trust. Every statistical person must have the capacity and capability to embody professionalism. The implementation of statistics must also be supported by statistical personnel who have integrity with manifestations of attitudes or behavior of service, discipline, consistency, openness, and accountability. Statistical personnel are also required to show a trustworthy attitude and uphold the value of honesty. These are attitudes and behaviors that can be a way to achieve the availability of quality statistical data.

BPS Blitar Regency involves census officers who have been strictly recruited to carry out the 2023 Agricultural Census. These enumerators receive thorough training before carrying out field data collection to achieve good performance in producing quality data. According to [9], the implementation of training and development can increase employee efficiency, skills, and productivity and show better performance. Training and development make workers have effective performance, capability, and competitiveness [10]. [11] concluded that individuals who had carried out training reported an increase in their knowledge and skills. Based on these conditions, success in undergoing training is an important factor in producing workers who are competent and able to carry out their duties. Thus, each training participant must achieve graduation in the training activities undertaken. In his conclusion, [12] stated that training and development produce workers with the skills and competencies needed to achieve performance and contribute to high productivity.

As a measure of graduation and eligibility to collect data, officers must get scores according to predetermined standards. Assessment is carried out from academic and non-academic aspects during training. Academic value is the assignments during training and the value of the final test of the material. Meanwhile, non-academic values come from attitudes and behavior during training.

In training and development, participants who graduate ideally have a thinking capacity that reflects intellectual and practical aspects. Apart from that, participants must have technical competence and, an understanding of broad and specific basic concepts and theories. Open-mindedness, effective communication skills, and being able to solve problems are also ideal requirements for participants to pass [13]. According to [14], training can change the work behavior of training participants and is characterized by understanding, skills, attitudes, and beliefs or value systems.

The enumerator's ability to absorb the material and understand it can show differences that can be seen from the value of each learning task during training and the final test of the material. The attitudes and behavior of enumerators during training have various values and are monitored by instructors as an important record regarding their basic attitude. This can be material for contemplation regarding the management of human resources to carry out data

collection. Apart from that, the age diversity of officers who have been accepted and are suitable for data collection can be a consideration in managing these resources.

So far, the process of monitoring and handling census officers has paid little attention to the characteristics that characterize academic training, attitude and behavior values, as well as consideration of age. Thus, grouping 2023 Agricultural Census enumerators according to the characteristics of task values, final test values, attitude and behavior values, and age can be a recommendation for handling problems in human resource management so that they can be encouraged to produce quality statistical data. [15] grouped workers based on levels of cognitive and emotional knowledge to identify the role of knowledge types in exploratory and exploitative innovation. [16] groups employees to determine productivity and effectiveness of future performance into very productive, moderately productive and unproductive clusters using the variables of work quality value, responsibility value, cooperation value, attendance value, and discipline value to shorten the time spent in more objective decision making. Grouping employees to determine HR competency and loyalty is carried out by [17] by dividing employee performance assessments into best, very good, and average using the variables of knowledge and skill values, as well as quantity and quality values so that they can make decisions promptly and objectively. To sum up, the study seeks to comprehensively understand the strategic management practices and human resource management strategies employed by BPS, with a focus on achieving its vision of providing quality statistical data to support national development goals.

2 Method

The research is quantitative to group officers for the 2023 Agricultural Census. This research uses secondary data on officers' training grades which include task grades, in-depth grades, and age. Cluster analysis produces several groups which allows for similar characteristics in each group [18].

This research uses secondary data which is the training value of Blitar Regency 2023 Agricultural Census enumerators. The number of training participants was 1.280 statistical partners from 22 districts in Blitar Regency. All training participants have been recruited through the recruitment system and have been declared qualified to take part in officer training.

The grouping process was carried out by paying attention to the average score of training officers in each district in Blitar Regency. Thus, the approach to the average value of each district will be the basis for the clustering method that will be applied in the research. This is useful for policy-making as well as obtaining the effectiveness and efficiency of monitoring treatment and evaluating data collection activities on data collection activities carried out by census officers in each district. BPS Blitar Regency can provide the same treatment to districts that have the same characteristics according to the results of grouping using the clustering method. Thus, each district has an average depth value, average attitude value, and average age of census enumerators.

Data processing uses SPSS software and the hierarchical clustering method, namely the ward method. In this method, the distance between the two clusters formed is the sum of squares between the two clusters [18]. The Ward method is also known as the minimum variance

method and must use the squared Euclidean distance [19]. The ward method is the best compared to the K-Means method [20]. According to [21], the ward method is the best compared to single linkage, average linkage, complete linkage, and centroid. The ward method is also the best method when compared with single linkage and average linkage [22].

3 Findings

Participants in the 2023 Agricultural Census enumerators training for Blitar Regency came from 22 districts according to their respective domiciles. Based on the results of this training, the average in-depth score for training participants for the 2023 Agricultural Census for Blitar Regency was 91.53. The highest average value is Sanankulon at 94.45 and the lowest average for Nglegok is 86.03.

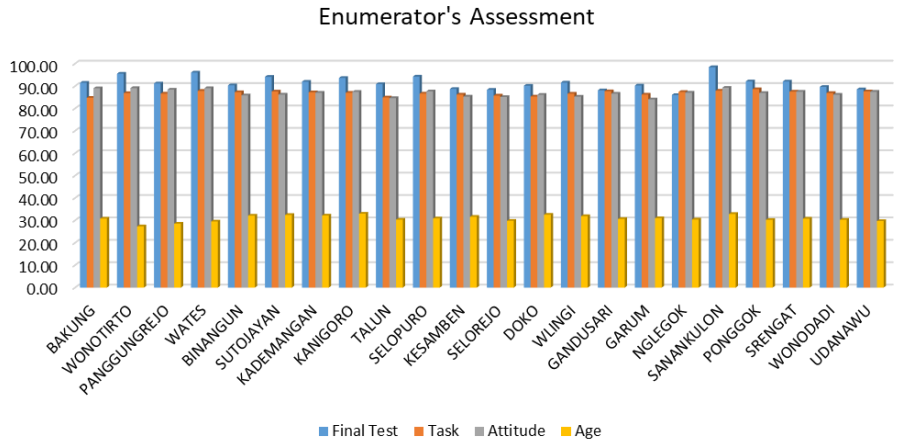

Figure 1: Enumerator's Assessment

The average assignment scores from the 22 districts are almost similar and have relatively little difference. The highest score for Ponggok was 86,63 and the lowest for Bakung was 84,79. Meanwhile, the average attitude and behavior scores in 22 districts show numbers ranging from 84 to 89. If you pay attention, the average age of the 2023 Agricultural Census enumerator training participants for Blitar Regency in each district is classified as young, between 27 and over 33 years.

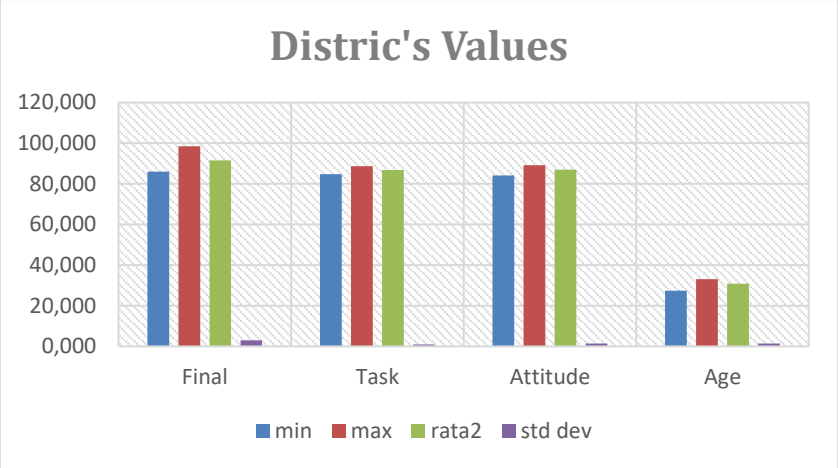

Figure 2: District's Value

Based on the analysis of standard deviation, it is observed that the relative final test variable exhibits the highest degree of variability in its average value compared to other variables. The smallest variation is in the average assignment scores, meaning that there is very little difference in the average assignment scores for trainees from 22 districts in Blitar Regency. Meanwhile, the average attitude and behavior scores and the average age of the 2023 Agricultural Census enumerators for Blitar Regency are relatively varied. Test assumptions to detect multicollinearity using Pearson correlation. Each variable has a VIF value of less than 10. Thus, multicollinearity does not occur so the assumption of using cluster analysis can be continued.

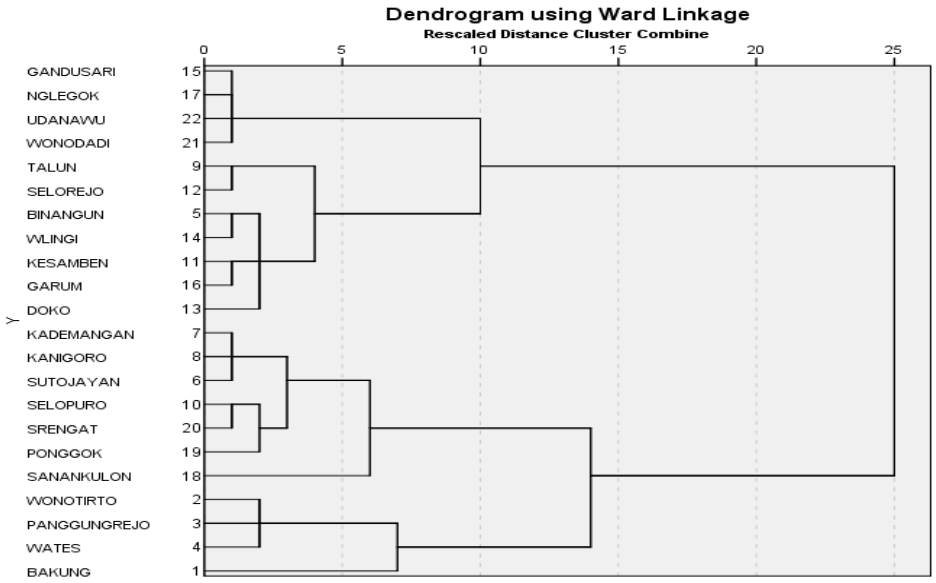

Figure 3: The Dendrogram Results

Figure 3 shows two main groupings that describe the average characteristics of the assessment of training participants for the 2023 Agricultural Census enumerators in 22 districts in Blitar Regency. The first cluster has an average final test value, task value, and attitude value higher than cluster 2, the average age of officers is more varied than cluster 2, and there are 3 districts where the average age of enumerators is under 30 years. The group consists of Bakung, Wonotirto, Panggungrejo, Wates, Sutojayan, Kademangan, Kanigoro, Selopuro, Sanankulon, Ponggok, and Srengat districts. The lowest average value for the final test of the first cluster was Panggungrejo with a figure of 91.19 and the highest was for Sanankulon with a value of 98.45. The average task scores and attitude scores are relatively uniform, ranging from 84 to 89.23 units. Meanwhile, the average age of training participants is relatively young, ranging from 27 to 33 years. There are 3 districts with an average age of training participants of less than 30 years, namely Wonotirto, Panggungrejo, and Wates districts.

The second cluster has an average final test value, task value, and attitude value lower than cluster 1, the average age of the officers is more homogeneous at around 30 years. This group includes Binangun, Talun, Kesamben, Selorejo, Doko, Wlingi, Gandusari, Garum, Nglegok, Wonodadi, and Udanawu. In this cluster, the average final test value is 86.03 to 91.58 with the highest value in Wlingi and the lowest in Nglegok. The average task and attitude scores are also relatively uniform in the range of 84 to less than 88 units. Meanwhile, the average age of 2023 Population Census enumerator training participants in this cluster is around 29 to 32 years.

Based on the information from the grouping results, it can be seen that Cluster 1 is better than Cluster 2. Thus the first group can be called good and the second group is poor. This grouping can be useful for creating monitoring treatments and evaluating data collection activities.

4 Discussion

The cluster method is very useful in assisting the implementation strategy process to achieve the goals that have been formulated. The grouping of enumerators for the 2023 BPS Agricultural Census of Blitar Regency can be used as inspiration to encourage action in managing human resources. The differences in group characteristics can be used as a reference for providing treatment in the context of monitoring and evaluating data collection activities.

The characteristics of the 2023 BPS Blitar Regency Agricultural Census enumerators are grouped into 2 large clusters. Each group represents districts with good census officer qualifications for cluster 1 and districts with fewer qualifications. Under these conditions, BPS can allocate human resources and different monitoring models and evaluation systems to support the continued availability of quality data.

[23] grouped training participants based on three main categories, namely achievement, leadership, and behavior. This grouping was carried out because gaps in the skills of employees who would take part in the training were identified. With this grouping, the HR department can prepare several education and training menus according to the abilities of employee groups.

[24] grouped the workforce to develop strategies for improving performance, improving welfare, and providing compensation plans for company employees in Brazil. The results of the clustering method show that the workforce is divided into 2 large groups. The first cluster is older employees, who use less overtime hours, and spend more time according to company

working hours. They are a group of employees with a tendency to have higher salaries than others. The second cluster is dominated by younger employees, who use overtime, lack time at the company, and have lower salaries. Policies for the first cluster relate, among other things, to pensions, remuneration, and appropriate career sustainability. Meanwhile, in the second cluster, mentoring and sharing policies can be implemented by colleagues who already have a lot of experience.

5 Conclusion

A series of efforts to obtain quality data is part of the BPS implementation strategy to achieve organizational goals. BPS Blitar Regency is carrying out the 2023 Agricultural Census based on orders and instructions from the top hierarchy by the mandate of the law. Implementing training for 2023 Agricultural Census enumerators is an initial step in supporting the availability of quality statistical data for advanced Indonesia.

In carrying out data collection activities for the 2023 Agricultural Census, human resources who are qualified, competent, and have good performance are needed. Thus, human resource management becomes an important component to achieve the stated goals. Supervision and evaluation in every data collection activity means efforts to maintain the quality of statistical data so that it can become a reference and portrait of the country's development.

Grouping enumerators for the 2023 Agricultural Census based on similarities in district characteristics is a step to make decisions regarding monitoring treatment and evaluation of data collection implementation. The clustering method is a solution for grouping enumerators for the 2023 Agricultural Census in Blitar Regency. The formation of 2 main clusters will make it easier for BPS Blitar Regency to prepare strategic allocations for the management of monitoring and evaluation of the 2023 Agricultural Census activities as part of the implementation strategy to achieve BPS's vision.

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