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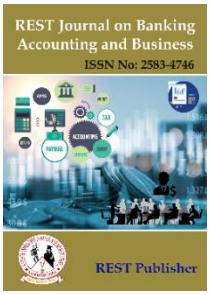

Evaluating the service quality of cooperative banks using the ARAS method

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Abstract: *Economic growth is heavily dependent on the banking sector, and consumer loyalty and happiness are largely determined by the quality of services provided. In particular, cooperative banks operate under a unique structure that combines financial and social objectives. Unlike commercial banks, they emphasize mutual support, social welfare, and member participation, while striving to maintain competitive service standards. Considering the increasing competition and changing consumer expectations in the banking sector, it becomes necessary to assess the service quality of cooperative banks. In order to increase customer happiness and loyalty, this study looks at the variables that affect service quality in cooperative banks and identifies areas that need work. Understanding the service quality of cooperative banks and how it affects customer satisfaction makes this research significant. To help cooperative banks improve their service offerings, this study identifies important service aspects such as efficiency, responsiveness, uniqueness, and reliability. The findings will help banking institutions implement strategies to enhance customer experience, strengthen relationships and maintain their competitiveness. Furthermore, this study lays the foundation for future research on customer satisfaction and service quality evaluation in cooperative banking. Other options include banks 1, 2, 3, and 4. Rating options: performance, responsiveness, customization, and reliability. The results indicate that Bank 2 achieved the highest rank, while Bank 4 the lowest rank being attained. "The value of the dataset for Service Quality of Cooperative Bank, according to the ARAS Method, Bank 2 achieves the highest ranking."*

Key words: *Service quality, cooperative banks, customer satisfaction, responsiveness, reliability, efficiency, banking competition, digital transformation.*

1. INTRODUCTION

Despite the existence of separate but related concepts, Cronin and Taylor (1992) and Brown and Schwartz (1989) have argued that it is difficult to specify a precise relationship between customer satisfaction and service quality. While it is clear that some banks perform better than others, these institutions are still not the majority. Institutions aim to consistently meet high standards in terms of quality, especially in the service sector. In the service sector, quality can be seen as a set of characteristics that characterize a particular service or as a standard for measuring those characteristics (Nightingale, 1986; Lovelock and Wright, 2002; Zeithaml, 1996). Furthermore, Nightingale (1986) and Brown and Schwartz (1989) have noted that quality is subjective, as different people have different perceptions of the qualities of services. This subjectivity is particularly evident in the banking sector. Furthermore, the inherent diversity of services has historically made them difficult to define, although two main approaches help to summarize their essence. [1] Cooperative banks operate on complex theoretical foundations, and their identity must take into account social and financial aspects. According to cooperative theory, cooperatives, as institutional entities, should create social benefits within their local communities. In addition to the well-known idea of corporate social responsibility, where commercial banks seek to increase their market share, these banks operate on the principles of self-help and

mutual aid. Cooperative banks, which are member-owned financial institutions, are complex businesses in which customers are also the owners. Their collective approach plays a key role in shaping their behavior and overall operation. [2]

FIGURE 1. Cooperative bank customers in old day

Cooperative bank customers can deposit and withdraw money at Post Office Counters Limited (POCL), Financial Service Centres (FSCs) located in Cooperative Retail Society stores or at convenient banks in the store. Under this scheme, transactions at these locations would involve customers visiting a PO, FSC or Handy bank for in-person counter services using paper-based processes. However, this does not include transactions made using plastic cards at the counter, as well as considerations related to infrastructure and staff travel. In England and Wales, there are 15,500 Post Office counters accessible to bank customers, which facilitated around 1.5 million transactions in 1998. In addition, 240 Handy banks processed over 1 million transactions, while 10 FSCs processed almost 0.5 million additional transactions in the same year. [3] The changing landscape and intense competition in the banking industry underscore the need to improve customer satisfaction and service quality to increase market share and profitability. Internal service quality and its consequences, particularly the current service level and critical employee behaviors that affect customer satisfaction, are highlighted within this framework. [4] The rapid expansion of globalization, especially the liberalization of banking services, is changing the way banks operate, with customers demanding higher quality services, greater efficiency and increased convenience. However, it is still difficult to assess the quality of services due to their inherent qualities, including ambiguity, inseparability, heterogeneity, and perishability. To increase customer satisfaction, banks – especially those in the private sector – need to focus on this important area. A 2009 study by the Institute for Policy Analysis and Research (IPAR) assessing customer care in Rwanda revealed that the banking sector achieved only 50% of overall service perception compared to customer expectations. [5] The development of the banking sector has been a key focus in the Southeastern countries, as it is essential for a smooth transition process. A two-tier banking system separating commercial banking and central banking functions was established as part of the first phase of banking reforms. But in its early stages, the financial sector prioritized growth in numbers over service quality. The establishment of new private businesses and the privatization of state-owned banks were the main drivers of the explosive expansion of financial institutions. In some countries, the industry was also quickly opened to international investment. [6] Although customer satisfaction levels in private and foreign banks are higher than in public sector banks, research on corporate image as a component of service quality and its effect on customer happiness is scarce in the Indian banking sector. Few studies have explicitly looked at the overall corporate image as a component of service quality and how it affects customer perception, especially in the case of Indian public sector or nationalized banks. [7] It is undeniable that some banks perform better than others, although their numbers are limited. When it comes to quality, companies – especially those in the service sector – aim to consistently achieve

high standards. Quality in the service sector refers to two different things: first, the set of characteristics that characterize a service, and second, the standard by which those characteristics are assessed or measured. [8] As Jordan's banking sector plays a major role in the country's economy, companies must employ creative strategies to increase value for both shareholders and customers. Gaining and maintaining competitiveness is crucial to preventing the industry from becoming marginalized. Efficient management of supply chain integration is a new solution. The SERVQUAL model, which includes important aspects such as commitment, responsiveness, empathy and reliability, is a popular multi-dimensional tool for assessing customer satisfaction. Three dimensions of financial aspects, accessibility and employee skills were also included in the study. Akbar specifically highlighted the link between customer satisfaction and service quality, stressing that more business, economic and management studies are needed to fully understand this relationship. [9] (1) To assess whether the adoption of joint purchasing and supplier relationships positively affects purchasing's ability to meet internal customer needs; (2) To examine whether the quality of purchasing services to internal customers is affected by the performance of other internal suppliers; and (3) To determine whether purchasing behavior improves the quality of products and services provided to customers outside the organization. To achieve these goals, a review of relevant literature was conducted, and a framework for service quality was developed that highlights the integrated function of purchasing in the supply chain and within the organization. [10] India's retail banking sector is growing rapidly, driven by changing customer demographics and psychological factors that necessitate the development of high-quality, differentiated services. Advances in technology and heightened awareness have significantly raised customer expectations. Maintaining consistent service excellence across all touchpoints has become a major challenge, further exacerbated by growing security concerns and rising operational costs. As financial services continue to expand within the Indian economy, the banking sector is expected to maintain its rapid growth, and industry profitability will continue to increase. [11] Robust hardware and software infrastructures, cultural and regulatory frameworks, CRM systems, and efficient human resource management are essential for e-banking. But, traditional banking remains the dominant method for conducting financial transactions in most countries. Reports indicate that despite significant investments in e-banking development worldwide, many potential users are not even receptive to these services when they have access to them. Banks have expressed concern over this, stressing the need to determine the factors that influence consumers' propensity to use online banking services in order to develop successful marketing campaigns. Furthermore, understanding the factors that influence users' perceptions of the adoption of new information technologies is crucial, as their attitudes play a significant psychological role in the success of an information technology implementation. [12] The purpose of this study is to examine whether bank customers and financial cooperative members place different values on specific attributes and how these differences affect the quality of relationships. While previous research has not examined whether the impact of website features differs between the two types of organizations, this study sheds light on the ways in which banks and financial cooperatives have different relationship dynamics. It also offers web-based tactics that each can use to foster lasting, effective interactions with their customers. [13] Quality can be broadly defined in four ways: relevance, value, fitness for purpose, and meeting or exceeding customer expectations. In the banking industry, the quality of products and services has become an important factor. Specifically, service quality refers to the effective fulfillment of customer needs by providing the required products and services. On the other hand, customer satisfaction is a measure of the extent to which expectations are met, and it refers to a customer's general satisfaction with the quality of goods and services. Customer satisfaction increases the likelihood that they will stick with a business, which ultimately increases its growth and profitability. [14] Operating financial institutions necessitates providing essential infrastructure facilities to customers. In this regard, customer opinions are moderate, with an average rating of 3.56, ranking this factor at sixth place, indicating that banks generally provide such facilities. Another important aspect of banking service quality is the banking network. Banks operate within specific timeframes, but also offer extended hours as per the convenience of the customer – for example, some banks offer evening banking services. In addition, prompt communication with customers is crucial, as timely access to information enhances the overall banking experience.[15]

2. MATERIALS AND METHOD

It can be challenging to evaluate real-world decision-making situations from a single criterion or perspective and find the best solution, as they are sometimes very complex and unstructured. Successful operation in the marketplace requires an understanding of the critical elements and circumstances that lead to bankruptcy. It is necessary to identify the factors that influence the growth and decline of potential alternatives. When using the single-criteria technique, researchers create a single measure that takes into account every relevant aspect of the problem. The decision maker's task is to evaluate a small number of options to determine which is best, sort them into predetermined homogeneous groups, rank them from most favorable to least favorable, or evaluate how well each alternative satisfies multiple

criteria at once. Ranking options according to specific decision criteria can be done in several ways. Using a multi-criteria approach, analysts develop multiple evaluation criteria from multiple perspectives. One of the most popular decision-making techniques in government, industry, and science is the multi-criteria decision-making method (MCDM). It takes into account a dynamic and complex world, improving the quality of decision-making by increasing the efficiency, rationality, and transparency of the process. In fact, decision makers must first define and analyze the situation, which involves determining and evaluating stakeholders, exploring possible alternative strategies, taking into account various significant selection criteria, and assessing the type and capacity of information already available. All parties involved in the decision-making process can accept the comparisons derived from the model when analysts set criteria. Although highly precise and often contradictory, criteria are measurements, guidelines, and standards that influence choices and represent preferences in actual or hypothetical actions. Typical MCDM challenges that aid decision-making processes include financial classification problems, employee ranking problems, and investment project selection problems. These problems are often classified as unique MCDM problems.

A new admission rate assessment (ARAS) method in multi criteria decision making.

Ranking a finite number of decision options, each clearly characterized by a unique decision criterion that must be taken into account simultaneously, is a common multi-criteria decision-making (MCDM) problem. The ARAS technique uses a utility function to determine the relative performance of a given option. The relative importance of the values and weights given to key project criteria is directly related to this performance. The first step in the process is to create a decision matrix (DMM). Any given problem is organized into discrete optimization problems using a DMM in the framework of MCDM, where m possible alternatives (represented by rows) are evaluated based on n significant criteria (represented by columns).

$$D = \begin{bmatrix} x_{01} & x_{02} & \cdots & x_{01} \\ x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{31} & x_{32} & \cdots & x_{3n} \end{bmatrix}$$

Where $x_{01}, x_{01}, \cdots x_{01}$ Shows the respective ideal values of the first, second, and nth attributes. If the size x_{0j} If you don't know, you can use the following two equations.

$$x_{0j} = \begin{cases} max.x_{ij} & | \ j \in B \\ min.x_{ij} & | \ j \in C \end{cases}$$

The following result matrix is normalized as follows

$$n_{ij} = \frac{x_{ij}}{\sum_{j=0}^{m} x_{ij}}$$

Weighted normalized matrix determined

$$N_{ij} = w_j * n_{ij}$$

The function for optimality Si is defined as the value that is considered to be large,

$$S_i = \sum_{j=1}^{n} N_{ij}$$

The final ranking of the options is based on the utility level. The range between 0 and 1 represents the utility level. The following formula gives the utility level Ki for the 1th option.,

$$K_i = \frac{S_i}{S_0}$$

Here S0 is the optimal value of Si.

The Attribute-Ranking Approach to Sustainability (ARAS), an organized framework for making decisions, ranks options according to various criteria, while also taking sustainability into account. As individuals and organizations increasingly strive to make choices that are consistent with environmental, social, and economic sustainability, ARAS provides a transparent and systematic approach to dealing with complex decision-making situations. The origins of ARAS can be traced back to the development of decision analysis in the mid-20th century, which aimed to introduce structured methods for dealing with complex choices by integrating quantitative and qualitative factors. As decision-making processes grew more complex, the need for methods capable of evaluating alternatives across multiple criteria led to the rise of multi-criteria decision analysis (MCDA). This field introduced systematic frameworks for evaluating alternatives by considering multiple attributes. ARAS serves as a valuable tool within MCDA, providing a structured approach to guiding complex decisions. By systematically analyzing alternatives through various attributes and sustainability factors, this method helps decision makers effectively prioritize and select the most appropriate options in situations involving multiple conflicting considerations.

Evolution parameter

Reliability: This refers to the reliability of banking services. Reliable banking ensures that transactions are executed accurately and are continuously available without system failures.

Personalization: In banking, personalization means providing services tailored to the specific needs of each individual. includes personalized product offerings, personalized interactions, and services that adapt based on customer behavior and preferences. A bank that excels in personalization can improve customer satisfaction and loyalty.

Responsiveness: is the ability of a bank to promptly respond to consumer inquiries and resolve issues. Responsiveness means that a bank provides timely support through various channels, ensuring that customers are respected and listened to. This aspect is crucial to maintaining a positive customer experience.

Efficiency: Efficiency is the ability to deliver highly relevant experiences and products to a large number of users in a short period of time. It involves the efficient conversion of inputs and data into reliable outputs, which is very important for banking operations.

Alternative

Bank 1: High, with minimal downtime and secure transactions. Personalization: Moderate, offers some personalized services, but no deep customization. Responsiveness: High, with fast customer service response times.
Bank 2: Moderate, with occasional service outages reported. Personalization: High, uses advanced analytics to provide highly personalized services. Responsiveness: High, response times vary depending on demand.
Bank 3: High, known for strong security measures and consistent service. Personalization: Low, offers consistent services with little customization. Responsiveness: High, excellent customer support available 24/7**.**
Bank 4: High, some issues with transaction processing. Personalization: High, offers basic customization options. Responsiveness: Low, slow response times and limited support channels.

3. ANALYSIS AND DISSECTION

TABLE 1. Service Quality of Cooperative Bank

	Reliability	Personalization	Responsiveness	Efficiency
max or min	7.56	8.59	6.55	6.89
Bank 1	6.9207	8.59	7.53	7.95
Bank 2	6.9425	6.92	7.7647	7.16
Bank 3	7.56	7.11	6.55	6.89
Bank 4	7.108	8.16	7.35	8.16

The service quality of cooperative banks is shown in this table according to four key criteria: efficiency, responsiveness, personalization and reliability. These elements are crucial for assessing both the overall performance of banks and customer satisfaction. The information includes scores for four specific banks, as well as the highest and lowest numbers for each category. Reliability, which measures the consistency and reliability of services, has a maximum score of 7.56. Out of the four banks, Bank 3 achieves this maximum score, indicating strong reliability. Bank 4 follows closely at 7.108, while Bank 1 and Bank 2 score 6.9207 and 6.9425, respectively, indicating moderate reliability. Personalization, which reflects how well a bank provides services according to customer needs, has a maximum value of 8.59. Bank 1 meets this peak value, excelling in customer-centric service. Bank 4 performs well with a score of 8.16, while Bank 3 and Bank 2 are low with scores of 7.11 and 6.92, respectively, indicating room for improvement in personalized interactions. Responsiveness, which measures the bank's speed and willingness to address customer needs, has a maximum recorded score of 7.7647. Bank 2, which shows a strong commitment to fast service, leads in this score. Bank 1 and Bank 4 perform well with scores of 7.53 and 7.35. However, Bank 3 lags behind with a minimum score of 6.55, indicating possible delays in service response. Efficiency, which measures operational performance, has a maximum score of 8.16. Bank 4 achieves this high score, indicating a high level of operational productivity. Bank 1 performs well with a score of 7.95, followed by Bank 2 with a score of 7.16. Bank 3 has the lowest score with a score of 6.89, indicating that process improvements are needed. Overall, while each bank exhibits strengths in different areas, Bank 4 shows well-rounded performance across most metrics.

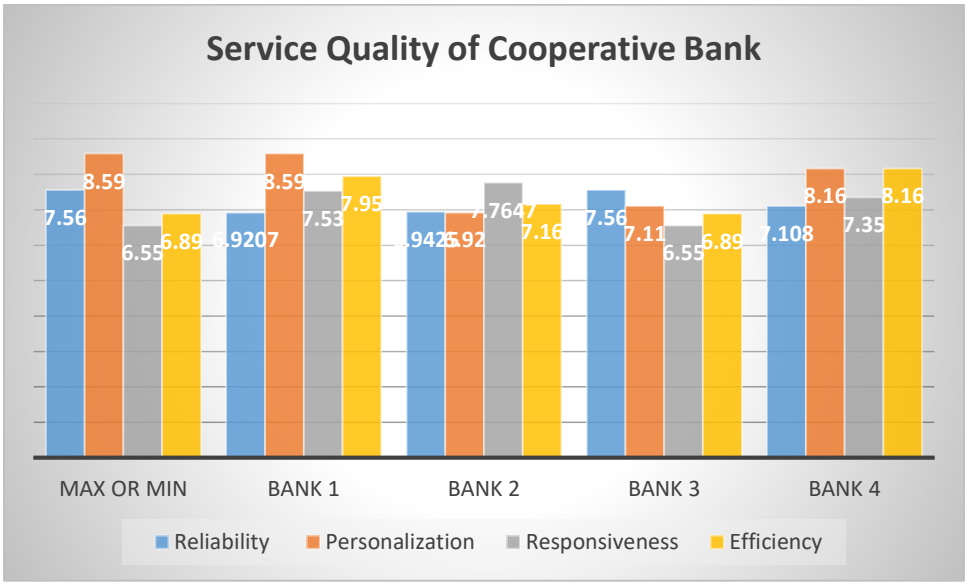

FIGURE 1. Service Quality of Cooperative Bank

The bar chart in Figure 1 shows four key components of service quality of cooperative banks: efficiency, responsiveness, personalization, and reliability. Each bank is rated on these factors, with the maximum and minimum values for each measure included for reference. Reliability, indicated in blue, has the highest recorded value of 7.56. Bank 3 reaches this peak, indicating strong reliability. Bank 4 follows closely with 7.108, while Bank 1 and Bank 2 score slightly lower at 6.9207 and 6.9425 respectively. This shows that all banks perform reasonably well on reliability, but with some variation. Personalization, shown in orange, measures how well a bank serves individual customers. The highest recorded value is 8.59, achieved by Bank 1. Bank 4 follows with 8.16, while Bank 3 and Bank 2 score slightly lower at 7.11 and 6.92 respectively. This indicates that Bank 1 excels in providing personalized services, while others have room for improvement. The gray response indicator shows how well and quickly banks can meet the needs of their customers. The highest value recorded is 7.7647, which was achieved by Bank 2, indicating excellent service speed. Bank 1 and Bank 4 perform well with scores of 7.53 and 7.35, respectively. However, Bank 3 has the lowest score of 6.55, indicating delays in responding. The performance, shown in yellow, assesses the efficiency of bank operations. The highest value recorded is 8.16, which was achieved by Bank 4. Bank 1 performs well at 7.95, followed by Bank 2 at 7.16. Bank 3, with 6.89, shows the lowest efficiency, indicating possible operational inefficiency. Overall, Bank 4 shows strong performance across most dimensions, while Bank 3 struggles in responsiveness and efficiency.

TABLE 2. Normalized Data

	Normalized Data			
max or min	0.2244	0.2114	0.2171	0.2140
Bank 1	0.2244	0.2063	0.1890	0.1855
Bank 2	0.2102	0.2114	0.1833	0.2060
Bank 3	0.1738	0.1812	0.2171	0.2140
Bank 4	0.1673	0.1897	0.1935	0.1806

Table 2 presents the normalized data for the service quality measures of cooperative banks. Normalization scales the values to a common range, which makes comparisons across various factors more meaningful. The table contains four main dimensions: reliability, personalization, responsiveness, and efficiency, with the maximum and minimum values provided for reference. For reliability, the highest normalized value is 0.2244. Bank 1 achieves this peak, indicating strong consistency in its service. Bank 2 follows closely with 0.2102, while Bank 3 and Bank 4 have lower values of 0.1738 and 0.1673, respectively. This indicates that Banks 3 and 4 may need improvements in maintaining reliable service. For personalization, which measures the personalization of banking services, the highest normalized value is 0.2114. Bank 2 achieves this maximum score, indicating a strong focus on personalized services. Following Bank 1 with a score of 0.2063, Bank 4 and Bank 3 score lower with a score of 0.1897 and 0.1812 respectively. This means that Banks 3 and 4 may have less personalized services compared to their competitors. Responsiveness, which reflects how quickly a bank addresses customer needs, has a maximum normalized value of 0.2171. Bank 3 achieves this maximum score, which shows a strong commitment to fast service. Following Bank 4 with a score of 0.1935, Bank 1 and Bank 2 score slightly lower at 0.1890 and 0.1833 respectively. This indicates that Banks 1 and 2 may have slower response times. Efficiency, which measures operational efficiency, has the highest normalized value of 0.2140. Bank 3 fits into this peak, which shows a higher operational efficiency. Bank 2 is followed by 0.2060, while Bank 1 and Bank 4 have lower scores of 0.1855 and 0.1806, respectively. Overall, Bank 3 excels in responsiveness and efficiency, while Bank 1 leads in reliability. Banks 2 and 4 show moderate performance on different dimensions.

TABLE 3. Weighted Normalized Data

	Weighted Normalized Data			
max or min	0.0561	0.0528	0.0543	0.0535
Bank 1	0.0561	0.0516	0.0473	0.0464
Bank 2	0.0526	0.0528	0.0458	0.0515
Bank 3	0.0435	0.0453	0.0543	0.0535
Bank 4	0.0418	0.0474	0.0484	0.0452

Table 3 presents the weighted normalized data for the service quality measures of cooperative banks. Reliability, personalization, responsiveness, and efficiency are four dimensions of service quality, which are weighted to reflect their relative importance. The table includes the maximum and minimum weighted scores along with the values for the four cooperative banks. For reliability, the highest weighted value is 0.0561. Bank 1 reaches this peak, indicating that it has the strongest reliability among banks. Bank 2 follows with 0.0526, while Bank 3 and Bank 4 score lower at 0.0435 and 0.0418 respectively. This indicates that Banks 3 and 4 may need to improve their reliability to increase customer trust. For personalization, which measures how well a bank provides services to individual customers, the highest weighted value is 0.0528. Bank 2 matches this maximum, indicating strong customer-centric services. Following Bank 1 with a score of 0.0516, Bank 4 and Bank 3 have scores of 0.0474 and 0.0453 respectively. This means that Banks 3 and 4 offer less personalized services than their competitors. For responsiveness, which measures how quickly a bank responds to customer needs, the highest weighted score is 0.0543. Bank 3 achieves this peak by highlighting its strong performance in resolving customer inquiries and problems. Following Bank 4 with a score of 0.0484, Bank 1 and Bank 2 score slightly lower with scores of 0.0473 and 0.0458 respectively. For efficiency, which measures the operational performance of the bank, the highest weighted score is 0.0535, which is achieved by Bank 3. Bank 2 is followed by Bank 1 and Bank 4 with scores of 0.0515 and 0.0464 and 0.0452 respectively. Overall, Bank 3 excels in responsiveness and performance, while Bank 1 leads in reliability. Bank 2 shows strong performance in personalization, and Bank 4 lags slightly behind in most categories.

TABLE 4. optimality function Si

	optimality function Si
max or min	0.2167
Bank 1	0.2013
Bank 2	0.2027
Bank 3	0.1965
Bank 4	0.1828

Table 4 presents the optimality function (Si) values for cooperative banks, which indicate their overall service quality performance based on weighted normalized criteria. To identify the best performing bank, the optimality function ranks banks based on a number of service quality factors, including responsiveness, efficiency, personalization, and reliability. For reference, the maximum and minimum values are included in the table. The highest possible Si value in the dataset is 0.2167, which indicates the benchmark for optimal service quality. No banks have achieved this exact score, but some come close, showing strong overall performance. Out of the four banks, Bank 2 ranks highest with a Si value of 0.2027, indicating that it performs well on several dimensions, effectively balancing reliability, personalization, responsiveness and efficiency. Bank 1 follows closely with 0.2013, which also provides strong service quality, but lags slightly behind Bank 2 in overall optimization. Bank 3 records a Si value of 0.1965, which indicates a moderate level of performance. Although the bank is not far behind the top two, there is still room for improvement in some areas of service quality. Bank 4 has the lowest Si value at 0.1828, which indicates that it lags behind its competitors in overall service quality. This indicates that improvements are needed in several dimensions such as improving efficiency, increasing responsiveness or improving reliability. Overall, Bank 2 emerges as the best performing institution, followed by Bank 1. Banks 3 and 4 show relatively low scores, with Bank 4 being weak in terms of optimality. The findings suggest that although the banks provide competitive services, there is room for improvement to achieve the highest benchmark of 0.2167.

TABLE 5. optimality function Si

	utility degree Ki
max or min	1
Bank 1	0.9288719
Bank 2	0.935404602
Bank 3	0.90692578
Bank 4	0.843367055

Table 5 presents the utility scale (Ki) values for cooperative banks, which reflect their relative performance in service quality. The utility scale measures how close each bank is to the optimal service quality scale, where a value of 1 indicates maximum performance. The table includes the maximum and minimum values along with the scores for each bank. Out of the four banks, Bank 2 achieves the highest utility scale at 0.9354, indicating that it provides services that are closest to the optimal level. This indicates that Bank 2 excels in key service dimensions such as reliability, personalization, responsiveness, and efficiency. Bank 1 follows closely with a Ki value of 0.9289, demonstrating strong service quality. Although slightly lower than Bank 2, its performance is competitive and higher than that of the lower ranked banks. Bank 3 has a utility scale of 0.9069, indicating a moderate level of service quality. This shows that even though banks are not lagging behind 1 and 2, some changes are needed to achieve the highest level of service efficiency and customer satisfaction. Bank 4 records the lowest utilization level at 0.8434, indicating that it lags behind other banks in overall service quality. This indicates the need for significant improvements, especially in areas where other banks perform better than it. Overall, Bank 2 is very close to the best service quality level, followed by Bank 1. Bank 3 is competitive but needs improvement, while Bank 4 has weak performance and needs improvements in several dimensions. The utilization level values highlight the relative strengths and weaknesses of each bank, showing areas where improvements can be made to achieve optimal service quality.

TABLE 6. Rank

	Rank
Bank 1	2
Bank 2	1
Bank 3	3
Bank 4	4

Table 6 presents the rankings of cooperative banks based on their overall service quality performance. The rankings are derived from the optimality function (Si) and utility degree (Ki) values, which evaluate banks on key service dimensions such as reliability, personalization, responsiveness, and efficiency. Bank 2 receives the first rank (rank 1), indicating that it provides the highest service quality among the four banks. This ranking is consistent with its strong performance in both optimality function (Si = 0.2027) and utility degree (Ki = 0.9354). Bank 2 demonstrates balanced strengths across all service dimensions, making it the most competitive institution in the dataset. Bank 1 is in second place (rank 2), showing the most competitive service quality. With a utility degree of 0.9289 and an optimality function score of 0.2013, it still performs exceptionally well, although slightly behind Bank 2. This indicates that Bank 1 is a strong competitor in the industry and may need only minor improvements to reach the top spot. Bank 3 ranks third (rank 3), indicating moderate performance. While its scores on responsiveness and efficiency are strong, its overall service quality is lower than the top two banks. The bank may need strategic improvements in reliability and personalization to climb the rankings. Bank 4 ranks lowest (rank 4), indicating weakness in overall service quality. With very low values in both Si and Ki, Bank 4 requires significant improvements across multiple dimensions to improve its service offerings and compete with higher ranked banks. In summary, Bank 2 leads in service quality, followed by Bank 1, while Banks 3 and 4 need improvement to improve their competitive position.

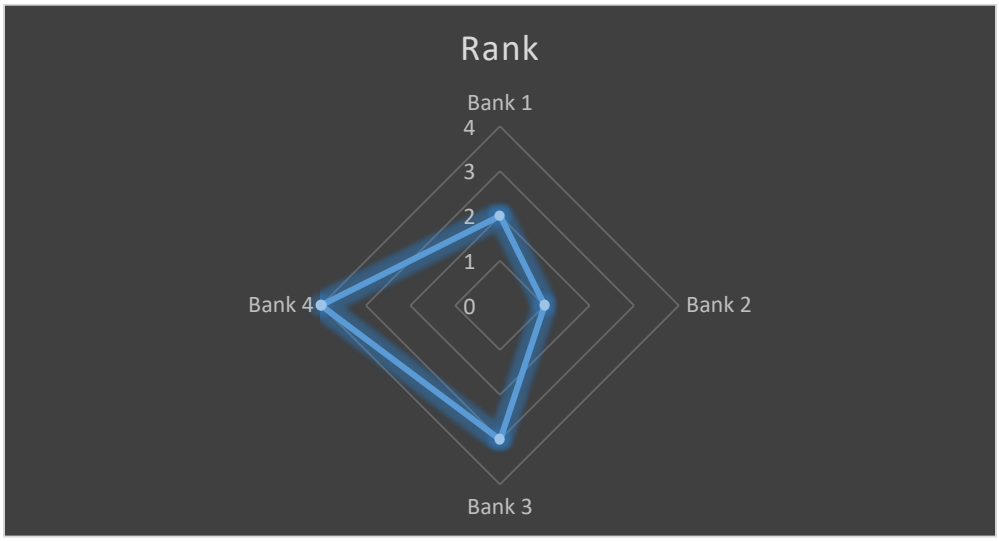

FIGURE 2. Rank

Figure 2 presents a radar chart showing the ranking of cooperative banks based on their service quality performance. This chart outlines the rankings of Bank 1, Bank 2, Bank 3 and Bank 4, which provides a clear representation of their relative positions. From the chart, Bank 2 occupies the lowest position in the scale (rank 1), which confirms its superior service quality. This is consistent with the previous analyses, where Bank 2 had the highest optimal function (Si = 0.2027) and utilization degree (Ki = 0.9354). The chart clearly shows that Bank 2 is the most competitive among the four banks. Bank 1 is positioned at rank 2, which indicates strong service quality performance, but is slightly below Bank 2. Its ranking suggests that it is a close competitor and could outperform Bank 2 with minor improvements in some service dimensions. Bank 3 ranks 3rd, reflecting moderate performance. Although it has significant strengths in responsiveness and efficiency, its overall service quality is slightly lower than Banks 1 and 2. The radar chart confirms that Bank 3 is a mid-level performer with room for improvement. Bank 4 ranks the lowest (rank 4), indicating the weakest service quality among the four banks. The chart highlights its position as the least competitive institution, confirming the findings from the previous tables. This indicates that Bank 4 needs significant improvements in reliability, personalization, responsiveness, and efficiency to improve its ranking. Overall, the radar chart provides a clear visual summary of the rankings, with Bank 2 leading in service quality, followed by Bank 1, while Banks 3 and 4 lag behind. This visualization helps identify areas for improvement and competitive positioning among cooperative banks.

4. CONCLUSION

Assessing service quality in cooperative banks reveals important insights into their performance across key dimensions such as reliability, personalization, responsiveness and efficiency. The findings indicate that although cooperative banks generally provide reliable services, there are differences in customer experience across institutions. Bank 2 emerged as the best performing institution, exhibiting strong balance across all service quality dimensions, particularly excelling in personalization and responsiveness. Conversely, Bank 4 ranked the lowest, highlighting the need for significant improvements in its service delivery, particularly in responsiveness and operational efficiency. One of the primary challenges faced by cooperative banks is maintaining high service standards while upholding their core cooperative values. Unlike commercial banks that prioritize profit maximization, cooperative banks need to balance social welfare and financial sustainability. The study highlights the need for continuous changes in staff training programs, technological improvements, and customer service tactics to meet changing customer expectations. The study also emphasizes how important consumer feedback is when assessing the quality of services. When considering the subjective nature of service quality, cooperative banks should actively seek customer feedback and implement data-driven solutions to improve service delivery. Using digital banking solutions, streamlining operations, and fostering a customer-centric approach can significantly improve customer satisfaction and loyalty. Future studies should examine the impact of digital transformation on cooperative banking service quality, and also conduct comparative analyses between cooperative banks and commercial banks. In addition, examining the influence of socio-economic factors on customer expectations and satisfaction can provide further valuable insights.

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