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Lean Six Sigma Approach in Determining Priorities for Service Improvement at Bank Rakyat Indonesia Based on Customer Perceptions, Expectations, and Interests

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ABSTRACT

This study explores the application of the Lean Six Sigma (LSS) methodology to determine service improvement priorities at Bank Rakyat Indonesia (BRI) based on customer perceptions, expectations, and interests. Using a mixed-methods approach with a sequential explanatory design, data were collected from 94 respondents through the Banking Service Quality (BSQ) framework and complemented with in-depth interviews. The study reveals significant gaps in several service quality dimensions, notably in effectiveness and accessibility. By employing the DMAIC (Define, Measure, Analyze, Improve, Control) framework, the research identifies critical issues and suggests strategic improvements, such as faster service delivery and reduced bureaucratic hurdles. These findings underscore the effectiveness of LSS in addressing operational inefficiencies while enhancing customer satisfaction in the banking sector.

Keywords: Lean Six Sigma; Banking Service Quality; DMAIC; Bank Rakyat Indonesia; Customer Satisfaction.

1. Introduction

Banks are essential pillars of economic development, serving as intermediaries for financial transactions. In Indonesia, the banking sector has grown rapidly, as evidenced by Bank Rakyat Indonesia's (BRI) continued success as a leading financial institution. However, the increasing competition in the banking industry necessitates a focus on service quality to retain and attract customers. Lean Six Sigma (LSS), a proven methodology for quality and efficiency improvement, offers an opportunity to address these challenges effectively (Lameijer et al., 2024).

This study aims to apply the LSS methodology to prioritize service improvements at BRI based on the analysis of customer perceptions, expectations, and interests. Utilizing the BSQ model, this research provides actionable insights into enhancing service quality, meeting customer needs, and maintaining BRI's competitive advantage.

2. Literature Review

2.1 Lean Six Sigma

LSS integrates Lean principles of waste elimination with Six Sigma's focus on variability reduction to improve efficiency and quality systematically (Sharikh et al., 2019). The DMAIC framework serves as a foundational tool, guiding organizations through problem definition, data measurement, root cause analysis, solution implementation, and control (Lamine, 2019).

2.2 Banking Service Quality

The Banking Service Quality (BSQ) model, developed by Bahia and Nantel (2000), comprises six dimensions: effectiveness and assurance, access, price, service portfolio, reliability, and tangibility. This model provides a robust framework for evaluating and enhancing banking services, particularly in customer-centric environments.

3. Research Methodology

3.1 Research Design

A mixed-methods approach with a sequential explanatory design was used. Quantitative data were gathered through customer surveys, and qualitative insights were obtained from interviews with BRI staff. This design enabled a comprehensive understanding of both external customer experiences and internal operational perspectives (Sugiyono, 2015).

3.2 Population and Sample

The study targeted active BRI customers who had interacted with the bank's services within the past six months. A purposive sampling method was used, yielding 94 valid responses.

3.3 Data Collection and Analysis

Quantitative data were collected using a BSQ-based questionnaire scored on a Likert scale. The questionnaire focused on customer perceptions, expectations, and interests in relation to BRI's service dimensions. To complement the survey data, in-depth interviews were conducted with BRI staff to reinforce the findings from the questionnaire. These interviews provided deeper insights into operational challenges and potential improvements, ensuring a balanced understanding of customer and organizational perspectives.

The analysis was conducted using the Lean Six Sigma DMAIC framework, incorporating the following tools at each stage:

1. Define: The SIPOC (Suppliers, Inputs, Process, Outputs, Customers) diagram was employed to map out the current service processes and identify key areas of concern.
2. Measure: Pareto analysis was used to prioritize the most significant issues based on the frequency and impact of service gaps identified in the customer survey.

3. Analyze: Root causes of the identified gaps were examined using a fishbone (Ishikawa) diagram, which provided a systematic understanding of the factors contributing to these issues.
4. Improve: Brainstorming sessions were conducted to develop practical and innovative solutions for addressing high-priority service problems.
5. Control: Mistake Proofing (Poka-Yoke) mechanisms were introduced to prevent recurring issues and ensure that the improvements remained consistent over time.

By integrating qualitative and quantitative data within the DMAIC framework and utilizing these specific tools, the analysis provided actionable insights for improving BRI's service quality.

4. Results

4.1 Characteristic of Research Respondents

The questionnaire for this study was distributed online via various social media platforms (Instagram, WhatsApp, Facebook, Telegram, Twitter) and through customer service at BRI Susukan. A total of 94 questionnaires were collected, all of which met the criteria for further analysis, resulting in a 100% eligibility rate.

The respondents consisted of 94 active customers of Bank Rakyat Indonesia (BRI) who have utilized the bank's services. They provided assessments and evaluations of the quality of services received, offering valuable context for analyzing BRI's service quality.

Table 4.1 Respondents' Characteristics Based on Gender

No	Gender	Quantity	Percentage
1.	Male	49	52,1%
2.	Female	45	47,9%
	Total	94	100%

Table 4.2 Respondents' Characteristics Based on Occupation

No	Occupation	Quantity	Percentage
1.	Entrepreneur (Self-employed)	12	12,8%
2.	Housewife	6	6,4%
3.	Civil Servant (PNS)	21	22,3%
4.	Private Employee	13	13,8%
5.	Student	36	38,3%
6.	Others (Merchant)	6	6,4%
	Total	94	100%

Table 4.3 Respondents' Characteristics Based Age

No	Age Group	Quantity	Percentage
1.	17 - 25 years	26	27,7%
2.	26 - 35 years	25	26,6%
3.	36 - 45 years	20	21,3%
4.	46 – 55 years	15	16%
5.	56 – 60 years	6	6,4%
6.	61 years >	2	2%
	Total	94	100%

Based on the respondent characteristics, the gender distribution is fairly balanced, with 52.1% male and 47.9% female, ensuring a well-rounded perspective. The majority of respondents are students, as reflected by the dominance of the 17–25 age group (27.7%) and occupation data showing 38.3% of respondents as students. Additionally, other age groups, such as 26–35 years (26.6%) and 36–45 years (21.3%), indicate participation from professionals, including civil servants (22.3%) and private employees (13.8%). This diversity in age and occupation reflects a varied respondent background, though predominantly from the younger generation actively utilizing BRI's services.

4.2 Validity Test Results

The validity test is carried out to determine the extent to which a questionnaire that is submitted can explore the data or information needed. Based on the result, the number of respondents (n) is 94, so the degrees of freedom (df) = 94-2 = 92, with a table value of r equal to 0.2028. From the validity test results, it is evident that the calculated r value for each variable indicator exceeds the table r value at the 0.05 significance level. Therefore, all the variable statements are considered valid and capable of measuring the concept or variable under investigation.

4.3 Reliability Test Results

Based on the result, it is obtained that the Cronbach's Alpha value on the six variables tested has a value greater than 0.7. indicating that all statements on these variables have an adequate level of reliability. Therefore, it can be concluded that these variables can be considered reliable or suitable for use in the context of this study.

4.4 Weighted Gap Calculation Results Table

Table 4.4 Weighted Gap Calculation Results Table

Dimension	Statement	Importance Score	Weight	Gap Value	Weighted Gap
Efektifitas	Pelayanan di bank BRI cepat dan tidak membuat saya menunggu lama	4.17	0.06	-1.61	-0.097
	Saat melakukan transaksi di Bank Rakyat Indonesia (BRI)	3.95	0.05	0.1	0.005

	saya tidak merasa terhambat oleh aturan yang rumit				
	Keamanan saat transaksi di Bank Rakyat Indonesia (BRI) sangat terjaga	4.05	0.06	-1.5	-0.09
Akses	Bank Rakyat Indonesia (BRI) menggunakan peralatan yang modern	4.07	0.06	0.02	0.0012
	Bank Rakyat Indonesia (BRI) memiliki jumlah teller dan customer service yang memadai	4.08	0.06	-1.5	-0.09
	Antrian menunggu transaksi di Bank Rakyat Indonesia (BRI) cepat	4.15	0.06	-1.58	-0.0948
Harga	Biaya untuk setiap transaksi di Bank Rakyat Indonesia (BRI) rendah bagi nasabah	4	0.05	-0.07	-0.0035
	Suku bunga untuk simpanan di Bank Rakyat Indonesia (BRI) terasa menarik	4.08	0.06	-0.01	-0.0006
	Bunga untuk pinjaman di Bank Rakyat Indonesia (BRI) terasa ringan	4.07	0.06	0.08	0.0048
Keterwujudan	Petunjuk pelayanan transaksi di Bank Rakyat Indonesia (BRI) sangat jelas	4.04	0.06	0.04	0.0024
	Kantor Bank Rakyat Indonesia (BRI) memiliki fasilitas yang memadai dan nyaman	4	0.05	-0.02	-0.001
	Penampilan pegawai di Bank Rakyat Indonesia (BRI) rapi dan elok dipandang	4.05	0.06	-0.05	-0.003
Portofolio Jasa	Jenis tabungan dan kredit yang ditawarkan menarik	4.02	0.06	-0.02	-0.0012
	Layanan transfer antar bank melalui ATM sangat baik di Bank	4.08	0.06	-0.07	-0.0042

	Rakyat Indonesia (BRI)				
	Layanan pembayaran tagihan melalui ATM sangat baik di Bank Rakyat Indonesia (BRI)	4	0.05	0.03	0.0015
Kehandalan	Karyawan Bank Rakyat Indonesia (BRI) mampu memberikan penjelasan yang mudah di mengerti kepada nasabah terkait transaksi yang dilakukan	4.08	0,06	-1.39	-0.0834
	Karyawan Bank Rakyat Indonesia (BRI) jarang bahkan tidak pernah melakukan kesalahan dalam pemberian layanan ke nasabah	4.02	0,06	0.07	0.0042
	Karyawan/karyawati mampu melakukan koreksi dengan cepat saat terjadi kesalahan dalam melakukan pelayanan	3.99	0,05	-0.03	-0.0015

The table above presents the weighted gap analysis of service quality dimensions at Bank Rakyat Indonesia (BRI) based on customer perceptions. It includes six dimensions: Effectiveness, Access, Price, Tangibles, Service Portfolio, and Reliability. Each statement is evaluated based on its importance score, weight, gap value (difference between expectations and perceptions), and weighted gap (gap value multiplied by weight).

In this analysis, the priority for service improvement at Bank Rakyat Indonesia (BRI) is determined based on customer perceptions, expectations, and importance levels. Of the 18 statements related to the quality of the bank's services, five main aspects that require more attention are:

1) Reliability: BRI employees should provide clear and easily understandable explanations to customers during transactions.
2) Access: Service speed needs to be improved to minimize customer waiting times in queues.
3) Access: The number of tellers and customer service representatives should be increased to ensure optimal service.
4) Effectiveness: Security in each transaction should be maintained to ensure customers feel comfortable and protected.
5) Reliability: Bank Rakyat Indonesia (BRI) employees are able to provide explanations that are easy to understand to customers regarding transactions made..

4.5 Lean Six Sigma
4.5.1 Define

Table 4.5 *SIPOC Diagram*

S	I	P	O	C
Suppliers	**Input**	**Process**	**Output**	**Customer**
Who supplies the process inputs?	**What inputs are required?**	**What are the major steps in the process?**	**What are the process outputs?**	**Who receives the outputs?**
Customer Service	Complaint data from customers	Receiving customer complaints	Solutions to customer issues	BRI Customers
Teller/Frontline staff		Analyzing the root cause of complaints	Identified issues	Internal stakeholders
BRI-Link Agent		Verifying reported issues	Improvement steps	
Technology Division		Escalating to relevant parties	Resolved complaint reports	
Technology		Resolving customer complaints	Improved customer satisfaction	

The SIPOC diagram outlines the complaint-handling process at Bank Rakyat Indonesia (BRI), starting with suppliers such as customer service, technology divisions, tellers, BRI Link agents, and digital tools that collect complaint data. The process includes receiving, analyzing, verifying, escalating (if necessary), and resolving complaints. Outputs include solutions, improved customer understanding, corrective actions, resolved complaint reports, and increased satisfaction. Customers, both external (BRI customers) and internal (management or teams), benefit from the resolution and improvements. This systematic overview ensures efficient complaint management, helping enhance customer service and satisfaction.

4.5.2 Measure

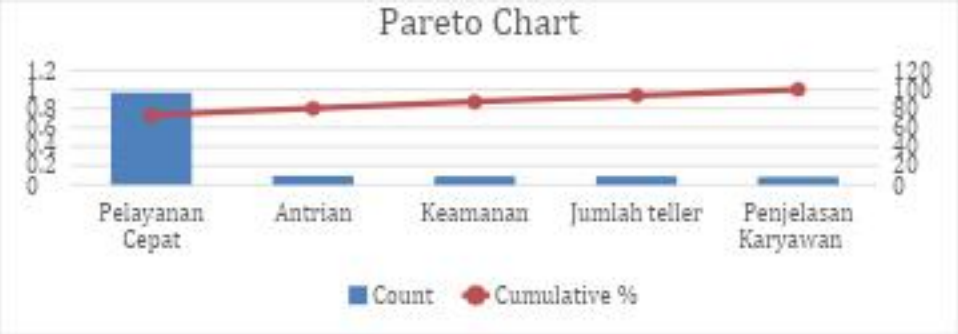

Figure 4.1 Pareto Chart.

The Pareto chart follows the 80/20 Rule, showing that 80% of the results come from 20% of the factors. Critical factors like "Efektivitas (pelayanan)" and "Akses (antrian)" dominate the left side, contributing the most to customer perceptions, while minor factors such as "Penjelasan" and "Akses (Jumlah teller)" appear on the right side with less impact. This highlights how focusing on the major factors can yield significant improvements in service quality. While the minor factors are less influential, they remain important for long-term improvements. This approach helps prioritize efforts for more efficient and effective decision-making in service enhancement.

4.5.3 Analyze

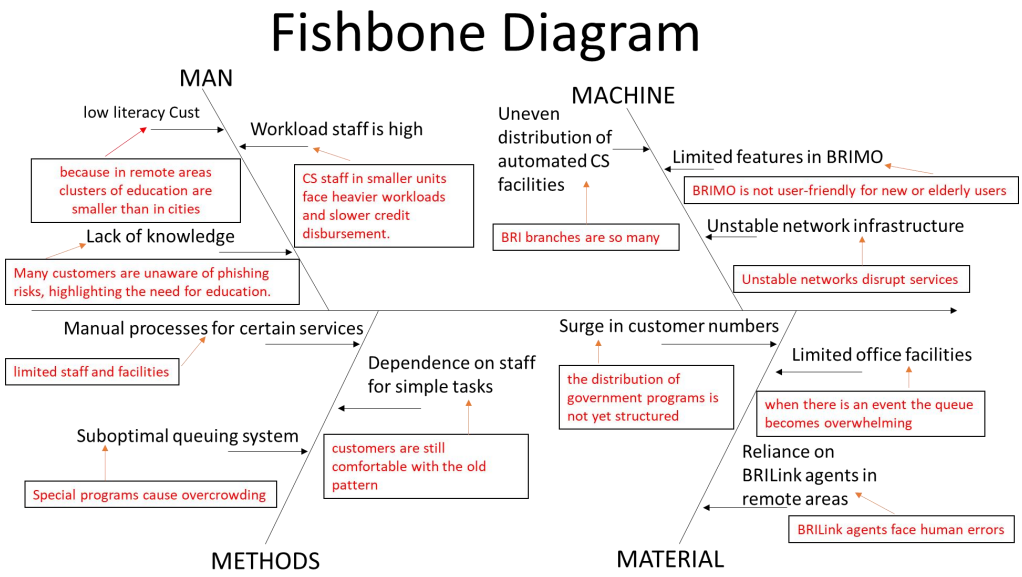

Figure 4.2 Fishbone Diagram.

The 4M diagram identifies the root causes of service challenges at Bank Rakyat Indonesia (BRI). Man-related issues include customer lack of digital security knowledge, low technology literacy in remote areas, and high workloads for customer service staff in smaller units. Machine-related problems involve uneven distribution of automated services, limited features in the BRIMO app, and unstable network infrastructure. Method-related challenges include reliance on manual processes, customer preference for traditional methods, and inefficiencies in the queuing system during surges. Material concerns focus on increased customer numbers during government

programs, limited office facilities, and reliance on BRILink agents in remote areas. Addressing these causes leads to targeted improvements and control.

4.5.4 Improve

The brainstorming session identified solutions to address key issues at BRI, focusing on digitalization, process improvements, workload management, and local government collaboration. Enhancing automation in smaller units and improving the BRIMO app would reduce CS staff workload and ease customer access to services. A digital education campaign and staff training would enhance customer security awareness and service efficiency. Optimizing BRILink agents for remote areas and implementing automated scheduling for government programs would streamline processes and reduce wait times. Better coordination with local governments would organize aid programs more efficiently and prevent service disruptions.

4.5.5 Control

To ensure consistent and continuous improvements, BRI can implement Poka-Yoke (error-proofing) across various service dimensions. Solutions include enhancing digital systems like BRIMO with user-friendly features and monitoring service times through automation to improve effectiveness and assurance (Sunder & Antony, 2018). In terms of access, digital queues, real-time alerts, and staff guidelines can reduce wait times, while automation can prevent transaction errors and improve complaint resolution for reliability (Hayati & Thabrani, 2019). Transparent notifications and real-time monitoring can address price concerns, while increasing space and optimizing event schedules can improve tangibles. Lastly, developing personalized services and conducting surveys can improve the service portfolio. These strategies, supported by digital tools and ongoing staff training, aim to sustain improvements and enhance customer satisfaction.

5. Discussion

This study demonstrates that the application of Lean Six Sigma at Bank Rakyat Indonesia (BRI) successfully identified and analyzed significant gaps between customer perceptions and expectations, particularly in the dimensions of service effectiveness and accessibility. Customer dissatisfaction was primarily attributed to slow service delivery and bureaucratic delays. During the DMAIC (Define, Measure, Analyze, Improve, Control) implementation process, the Define phase effectively pinpointed critical issues, such as slow transaction times and service reliability. The Measure and Analyze phases utilized tools like Pareto Charts and Fishbone Diagrams to uncover the root causes of inefficiencies. The findings indicate that Lean Six Sigma is effective in improving operational efficiency and customer satisfaction by eliminating non-value-added activities and reducing process variation. This research highlights the relevance of Lean Six Sigma as a framework for addressing service quality challenges in the banking sector, particularly in developing countries like Indonesia, by providing a systematic approach to overcoming specific service quality issues.

6. Conclusion

The results of this study affirm that Lean Six Sigma is an effective methodology for identifying and prioritizing service improvements in the banking sector. Customer satisfaction at BRI

heavily depends on reducing bureaucratic hurdles and ensuring reliable and efficient services. Therefore, BRI is advised to focus on streamlining service processes, particularly in terms of transaction speed and reliability. Continuous training and development of staff are also necessary to enhance customer trust and satisfaction. From a theoretical perspective, this research bridges a gap in the Lean Six Sigma literature by applying it to the context of banking in Indonesia, thereby enriching the understanding of service quality improvement in developing economies. For future research, it is recommended to broaden the scope to include other banking institutions in Indonesia to validate and expand these findings. Additionally, integrating Lean Six Sigma with emerging technologies, such as artificial intelligence, could further enhance banking services and operational efficiency in the future.

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