



Quality Improvement to Enhance Customer Satisfaction Using Lean Six Sigma (Case Study: XYZ Restaurant)

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ABSTRACT: Bandung was designated as a national culinary destination city in 2017 by the Ministry of Tourism due to its culinary diversity. The development of food and beverage businesses in Bandung, which increased from 524 in 2020 to 729 in 2021[4], shows that competition in the culinary business is quite intense. XYZ is one of the restaurants that can survive during the Covid-19 pandemic. However, XYZ often experiences complaints from customers regarding the quality of its products and services. Usually, this restaurant can receive 200-300 customers on weekdays and 400-600 customers on weekends. But until now, XYZ only receives 50% of its customers. This research will discuss the improvement of product and service quality using the DMAIC Lean Six Sigma methodology. The research uses primary data by distributing questionnaires to XYZ customers who visited in 2021 to 2023. From the results of the questionnaire, 4 out of 19 sub-variables customers feel that the performance is not good but has a high importance, namely in T1 (Taste), TX1 (Texture), E1 (Empathy), and R1 (Reliability). These four indicators need to be improved so that customers feel satisfied with the services and products provided by XYZ. Based on the main problems from the data obtained, quality improvement efforts that can be made such as employee training and quality control at suppliers. These efforts aim to improve and maintain the quality of XYZ for the long term so that an increase in the number of customers can be achieved, such as 200-300 visitors on weekdays and 400-600 on weekends.

KEYWORDS: Customer Satisfaction, Lean, Restaurant, Six Sigma, SERVQUAL.

1. INTRODUCTION

Human lifestyle is changing, food can be used as an object for certain events such as tourism events, family events, or company meeting events. Restaurants provide these services and products at the same time so that consumers do not have difficulty in cooking or thinking about food ingredients. The restaurant also provides a place that is pleasing to the eye and comfortable because apart from food and services, the restaurant also sells the atmosphere of the restaurant so that consumers can enjoy and feel comfortable while at the restaurant. The atmosphere consists of both physical and non-physical elements (Walker, 2009).

Bandung was designated as a national culinary tourism destination city in 2017 by the Ministry of Tourism because it has a variety of culinary delights. Also, Bandung has been named as one of the cities with the best traditional food in Asia at the 2021 Taste Atlas Awards with a score of 4.39 out of 5 and in 5th place (Rob, 2022). This makes Bandung a city known for its best cuisine and snacks that can make visitors, both domestic and foreign visitors, feel satisfied with their culinary tour.

There is an increase in the number of culinary businesses in Bandung every year, as shown in figure I. However, in 2020 there was a drastic decline caused by the Covid-19 pandemic. Then, in 2021 the culinary business increased to 791 culinary businesses (Dinas Pariwisata dan Kebudayaan, 2021).

XYZ is one of the restaurants in Bandung that serves many types of steak. But XYZ has experienced a decline in visitors until now and often receives complaints from customers about the products and services of XYZ. To improve the quality of the products provided by XYZ, this research will use Lean Six Sigma. Six Sigma is useful to reduce the variability of product quality that often occurs at a certain level in order to reach 3.4 defects from one million production or 99.99966% (Montgomery & Woodall, 2008). At the same time, Lean is useful for improving the production process whose main purpose is to reduce waste from the production process itself (Holweg, 2007). According to Shah et al. (2008), there has been a survey of 2511 companies that used a combination of Lean and Six Sigma, which produced good results.

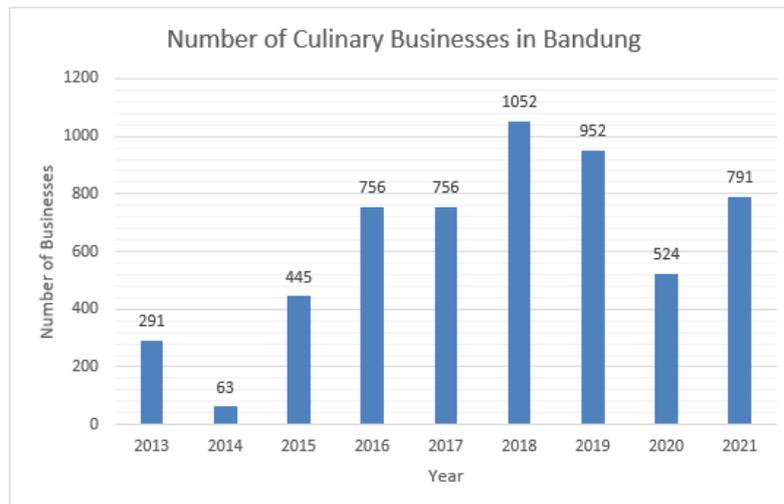


Figure I. Number of Culinary Businesses in Bandung (Source: Dinas Pariwisata dan Kebudayaan, 2021)

With more competitors in the culinary business in Bandung, customer satisfaction needs to be considered by improving the quality. According to Worsfold and Jameson (1991) who explained that food quality, environment, and service need to be improved over time. The importance of high-quality service can be increased by evaluating the customer's view according to the experience and expectations of the customer using SERVQUAL.

This research aims to focus on XYZ as the main object of study. The purpose of this research is to identify areas for improvement in the quality of products and services offered by XYZ. The goal is to improve the overall quality of the products and services offered in order to provide customers with a better experience and increase customer satisfaction.

2. LITERATURE REVIEW

A. Service Quality

Customer satisfaction is affected by the service and product quality produced by the company. When the service or product meets the expectations of the customer, the company has shown high quality. Companies that have high quality can definitely fulfill customer satisfaction (Kotler, 2016, p. 156). Based on Lupiyoadi (2001), in customer satisfaction, there are several things that become the intention to repurchase, one of which is product quality and service quality that provided by the company. Customer satisfaction is an important thing for companies to pay attention to (Tjijtono & Diana, 2015) that if the customer is satisfied with the performance of the company, the customer will find it difficult to switch subscriptions to other companies.

According to Parasuraman et al. (1988), service quality is the perception of the comparison of customer expectations with the actual performance they experience. Therefore Parasuraman et al. (1998) created something useful for measuring service quality, namely SERVQUAL. SERVQUAL is useful for measuring expectations of service against the reality of the service experienced. Then according to Parasuraman et al. (1998), service quality can be seen in the variables of tangibles, empathy, responsiveness, reliability, and assurance.

1. Tangible, companies must create a favorable impression by using tangibles, which are material things that describe the physical form and services obtained by clients.
2. Empathy, is a genuine concern for the consumer that is expressed to them through customized services.
3. Responsiveness, is the ability to be responsive is the awareness of or desire to assist the customer in receiving service swiftly and accurately in response to the customer's request.
4. Reliability, is the ability to deliver the promised service with accuracy and dependability.
5. Assurance, is about politeness, knowledge, and the ability to create trust.

According to Crosby (1979), quality is conformity with requirements. According to Gronroos (1990), product quality is indirectly related to the technique of the specifications of the product being made. According to West, Wood and Harger (2006), food quality can be seen by the variable appearance, portion, temperature, aroma, degree of maturity, taste, shape, and texture.



B. Importance-Performance Analysis

IPA is using customer satisfaction surveys which are useful for opportunities that companies can improve by using information from surveys conducted. The survey is conducted to determine the importance and performance of the company from the perceptions of respondents who are usually carried out to the company's customers using a scale (Oliver, 1997). According to the assumption that customers who have low performance and high importance to the company will be able to see opportunities that can be improved (Slack, 1994; Oliver, 1997).

The purpose of IPA is to help company managers and marketing divisions to find out what aspects of services or products are underperforming and overperforming (Griffin & Edwards, 2012, p. 33). IPA has a matrix that is divided into four quadrants, as in figure 2.1, which is assessed from the performance rating. The four quadrants are concentrate here, keep up the good work, low priority, and possible overkill. The following is an explanation of each quadrant according to Martilla & James (1977):

1. Concentrate here, showing that the customer considers it very important but has poor performance.
2. Keep up the good work, indicating that the customer considers it very important and has a good performance.
3. Low priority, indicates that the customer considers it unimportant but has a low performance
4. Possible overkill, indicating that the customer thinks it is not important but has good performance.

C. Lean Six Sigma

Six Sigma is one of the management tools used to replace Total Quality Management (TQM) tools. TQM is a tool used to manage all organizations in terms of products or services that have two operational goals, namely:

- a) Be careful in designing a product or service
- b) Ensuring the organization's system can produce its designs consistently

Six Sigma functions to control quality by exploring the company's production system with the aim of reducing or eliminating production defects, cutting production time, and reducing production costs. This means Six Sigma is a tool used for troubleshooting to create a smooth process according to the design. In statistics, Six Sigma has a high capability value in processes, products, or services, with 99.9997% accuracy (Heizer et al., 2017).

While Lean is a method that aims to improve a process by reducing activities that do not have added value and improving work processes that are more effective and efficient. Lean aims to increase added value to products in order to provide value to customers by increasing the ratio between added value and waste (Gaspersz, 2006). Then, Lean Six Sigma is a combination that has the goal of identifying and eliminating waste or non-value-added activities through continuous improvement to achieve good performance (Gaspersz, 2006).

According to Heizer, Render & Munson (2017), Six Sigma can help managers describe performance from process variability requirements and compare common process metrics. Metric is defects per million opportunities (DPMO) which consists of three data, namely:

- a) Units. The number of goods produced or services being performed.
- b) Defects. Goods or services that do not meet consumer expectations because they do not meet consumer requirements.
- c) Opportunities. The possibility of goods or services that are defective or do not meet the requirements of consumers.

The Six Sigma process will produce products with defects of not more than 3.4 defects per million units, and the process results are 99.9997% between -3σ and $+3\sigma$, where the output variable is placed in the normal distribution, making three standard deviation units from its mean (central point). In order to get six sigma process control using normal distribution and standard deviation. In the Six Sigma methodology, there are stages in the problem-solving process called DMAIC, which stands for define, measure, analyze, improve, and control, which are the stages of DMAIC itself. According to Heizer et al. (2017), this is the definition of DMAIC respectively:

- a) Define, and outline the project's objectives, range, and results in determining the necessary process data.
- b) Measure, measurements and data gathering.
- c) Analyze, analysis of the data to ensure consistency and reliability.
- d) Improve, current processes and procedures being modified or redesigned.
- e) Control, regulating the new procedure to ensure that performance standards are upheld



3. METHODOLOGY

This study uses the results of interviews with the manager of one of the XYZ branches and use the results of distributing questionnaires to several respondents with the criteria of having visited and ordering food at XYZ in 2021 until 2023 as primary data where XYZ has experienced a decrease in visitors calculated since 2021 because customer can dine-in at the XYZ restaurant. Interviews with XYZ managers were conducted in person on November, 2022, and questionnaires were distributed online using a Google Form to reach customers who had experienced a decline or the quality of XYZ did not meet customer expectations. Also, in this study, the data used was to collect similar research and existing theories with the aim of assisting researchers in resolving and finding root causes and solutions to problems found in the companies studied. The data used can be in the form of journals, books, and reliable sources such as data from the internet. Secondary data is considered easy to obtain because of the existence of the internet which makes it easy to search for theories or journals that have been published publicly.

4. FINDINGS AND ARGUMENT

A. Measure Stage

Based on the results of the questionnaire obtained, it is attached in table I for the mean for each sub-variable. At the measure stage, it will discuss what indicator that important to analyze because it has a significant gap in Importance and Performance. By determining the gap, the company sees what is important according to customers but has low performance.

Table I. Analysis Gap Between Importance and Performance of The Restaurant.

Indicator	Importance (Y-Axis)	Performance (X-Axis)
L.1	4.05418719	3.89655172
L.2	3.90147783	3.77832512
P.1	3.89162562	3.74384236
TM.1	3.97044335	3.7044335
S.1	3.97536946	3.86699507
ML.1	4.04926108	3.8226601
T.1	4.12315271	3.74384236
TX.1	4.02463054	3.60098522
TN.1	3.91625616	3.45812808
TN.2	3.92118227	3.78817734
R.1	3.98522167	3.73891626
RS.1	4	3.80788177
RS.2	3.95566502	3.64039409
R.1	3.86699507	3.77832512
R.2	3.98522167	3.92610837
R.3	4.06403941	3.7635468
A.1	4.03940887	3.82758621
A.2	3.93596059	3.92610837
A.3	3.98029557	3.99507389

The Measure stage is a step in the process of improving a business's performance. In this case, this research is trying to determine which indicators are most critical to pay attention to due to their poor performance but are still very important to customers. To achieve this, this research will use the IPA (Importance-Performance Analysis) Matrix. The score can be calculated and then averaged as in table I which will then be entered into the IPA Matrix to be plotted in each quadrant with importance on the Y-axis and performance on the X-axis.



• Importance-Performance Analysis

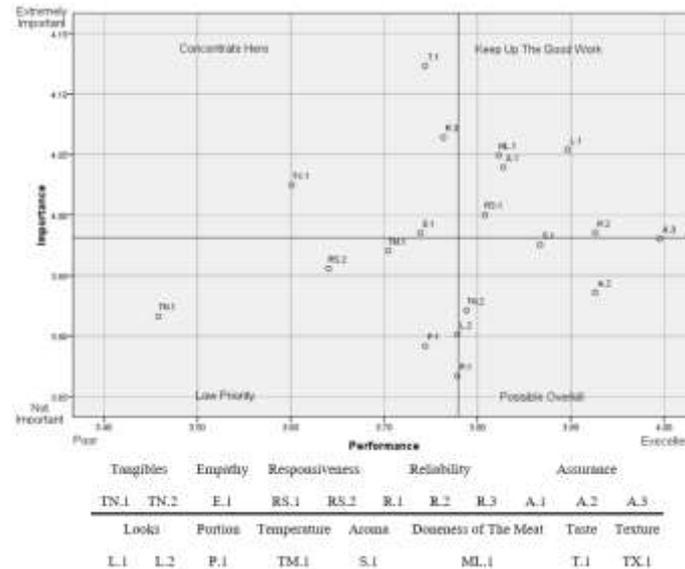


Figure II. IPA Matrix.

The importance-performance analysis is a method for looking for a gap analysis between the performance of a variable and consumer expectations used to determine priorities or focus on the indicators used by looking at the level of performance based on what is experienced by the customer and what the customer expects to be. From what was obtained, there were 19 questions with a total of 203 respondents, as shown in figure II and divided into four quadrants, namely quadrant 1 concentrate here, quadrant 2 keeps up the good work, quadrant 3 low priority, and quadrant 4 possible overkill.

• Quadrant 1 Concentrate Here.

There are four indicators that are included in quadrant I, namely T1, TX1, E1, and R1 is an indicator that is included in the sub-variable taste T1 is useful for knowing the performance of the taste ordered by the customer whether it is in accordance with the standard or not. TX1 is included in the texture sub-variable, discussing how the performance of the texture of the product ordered by the customer, whether it is according to standard or not. E1 is included in the empathy sub-variable, which is useful for evaluating how employees perform in understanding customer desires. R1 is included in the reliability sub-variable, which is useful for knowing how the performance of employees in serving customers, whether they have followed the procedures determined by XYZ as a standard or not.

• Quadrant 2 Keeps Up The Good Work.

In quadrant 2 there are 3 indicators, namely, L1, ML1, RS1, R2, A1, and A3. Question L1 is a sub-variable "looks" to find out the performance of the cleanliness of the food ordered and whether it is important or not. ML1 is in the Doneness of the meat sub-variable to find out whether the steak ordered by the customer is in accordance with the actual, knowing that there are five levels of doneness, namely rare, medium rare, medium, medium well, and well done. RS1 is a responsiveness sub-variable that is useful for evaluating employees' performance in addressing the needs of customers. R2 is in the reliability sub-variable to determine the accuracy of employees in making food according to customer desires. Then the last one in quadrant 2 is A1 and A3, which are in the assurance sub-variable that is useful for knowing employee knowledge of the product (menu) and politeness from employees to customers.

• Quadrant 3 Low Priority.

In this third quadrant, there are 6 indicators, each of which is from questions L2, P1, TM1, TN1, RS2, and R1. L2 is in the sub-variable looks, which is useful for knowing the performance of the attractiveness of the food served. P1 is in the sub-variable portion, which is useful for knowing the performance of the portion served by the restaurant and whether it is in accordance with customer



desires. TM1 is in the temperature sub-variable, which is useful for knowing the performance of the food temperature served and whether it is in accordance with customer desires. TN1 is in the tangible sub-variable, which is useful for knowing the performance of the restaurant's attractiveness. RS2 is in the responsiveness sub-variable, which is useful for knowing whether employees are swift in responding to customer complaints because the product or service is not in accordance with the wishes of the customer. Then the last is R1 in the reliability sub-variable which is useful for knowing whether the information provided by employees is accurate or not.

- Quadrant 4 Overkill.

In quadrant 4 there are 3 indicators that are part of it, namely in questions S1, A2, and TN2. S1 is in the aroma sub-variable, which is useful for the performance of the attractiveness of the aroma of the product ordered. A2 is in the Assurance sub-variable, which is useful for knowing whether employees are friendly in welcoming and providing services to customers or not. The last question is TN2 which is a sub-variable of tangibles that is useful for knowing the tidiness of employee clothing and whether it meets the standards of the customer or not.

B. Analyze Stage

At this stage, it will discuss the dimensions that are considered the most important and have poor performance according to customers. As in the IPA Matrix listed in quadrant 1 concentrate here there are four dimensions, namely Taste, Texture, Empathy, and Reliability, which get the lowest ranking. Based on these 4 dimensions, this research will focus on indicators or questions that enter the concentrate here quadrant.

Table II. Mapping Priority for Analysis and Improvement.

Item Name	Dimension	Sub- Variable
T.1	Taste	Appropriateness of the taste of the food served (Q7)
TX.1	Texture	Compatibility of food texture with the type of food ordered (Q8)
E.1	Empathy	Employees understand the desires of buyers (Q11)
R.1	Reliability	Employees perform services reliably and consistently following established procedures (Q16)

This step refers to the process of identifying the underlying cause of a problem. By determining the root cause, it becomes possible to determine what actions need to be taken in order to effectively resolve the problem. In this study, the Ishikawa diagrams are the tools being used to uncover the root cause of the problem. Ishikawa diagrams, also known as fishbone diagrams or cause-and-effect diagrams, are used to identify all of the possible causes of a particular problem or issue.

Based on the results of interviews with the manager of XYZ and align with Battarjee et al. (2014), the causes of there is low performance on taste, texture, empathy, and reliability is because of 4 root causes which are personnel (employees), management (human resources), raw materials, and supplier. The explanation of each root cause is as follows:

- a) Employees, in this case, human error that makes the quality of service low and also affects the quality of the product, Lack of employees, training for chefs and waitresses, and the knowledge of the waitress.
- b) Human Resources, HR is responsible for recruiting employees and also training employees if needed. In HR, it is necessary to consider personnel skills and the number of personnel.
- c) Raw material, the occurrence of the taste or texture of the meat is not only the wrong way of processing but also due to the poor quality of the meat so that after processing, it does not produce maximum products or because it has been stored for too long so that the quality is not very good.
- d) Suppliers, supplier performance is important to analyze. In this problem the things that must be analyzed are the quality of the raw materials they produced. XYZ several times rejected meat shipments from suppliers because they did not have the right quality, such as inappropriate weight or excessive meat content.

To find the root cause of the problem in each indicator in concentrate here quadrant, data retrieved from the interview with the manager of XYZ is used as in table 3.1 and aligned with previous research that was researched by Batarjee from research on Pizzeria Restaurant. The goal is to identify the most likely cause or causes so that appropriate action can be taken to resolve the issue in each indicator.

- Root cause analysis in T1 (Taste) Appropriateness of the taste of the food served.

For problems in T1, there are three root causes, namely product, service, and human resources. The thing that is most related to the taste that is not good or not in accordance with customer expectations is the product. According to interviews with managers, this usually happens because of mistakes in cooking and also mistakes in giving too much or too little seasoning.

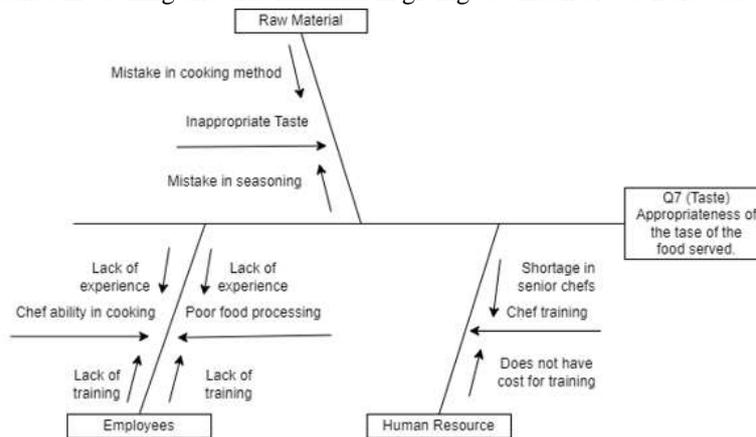


Figure III. Ishikawa Diagram for T1.

The second root cause is service, namely the lack of a chef's ability to cook dishes ordered by customers. Chefs in a restaurant should be able to cook or process all the food on the restaurant menu. This root cause is related to the third root cause, namely human resources. These things happen because of a lack of training or experience of the chef. HR is responsible for this problem because HR is supposed to provide training in the process of recruiting employees. Then, the lack of senior personnel to train new chefs or those with less experience than senior chefs is one of the causes.

- Root cause analysis in T1 (Texture) Compatibility of food texture with the type of food ordered

In the T1 problem, there are three root causes, namely product, service, and supplier. Customer complaints due to the tough texture of meat usually occur due to poor quality from XYZ suppliers. The quality level provided by the supplier is not certain every week. Therefore, the manager of XYZ must also choose the decision to take the meat or not. If the decision is not to take the product, then all menus with the type of meat rejected will not be on the menu. This also happens because there is no personnel from XYZ who becomes quality control at the supplier company. Then the last is the chef's ability to cook or process the food. Cooking steak requires expertise in cooking techniques grilling time, defrosting frozen meat, or letting the steak rest after cooking in order to get the specifications desired by the customer.

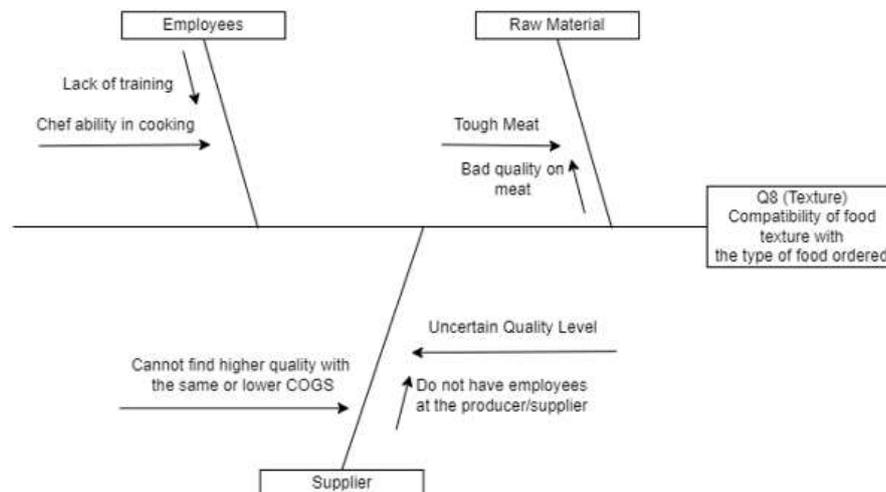


Figure IV. Ishikawa Diagram for TX1.

- Root cause analysis in E1 (Empathy) Employees understand the desires of buyers

In E1, there are only two related root causes, namely, service and human resource. Employees are unable to understand the wishes of customers due to overly complicated food customization, lack of training, lack of communication, and lack of experience. Employees in this scope are chefs and waitresses. What usually happens is when the waitress does not know the product that the customer wants. This indirectly affects human resources because of the lack of employee training. Human resources also cannot conduct free training because it will press additional costs that are not cheap.

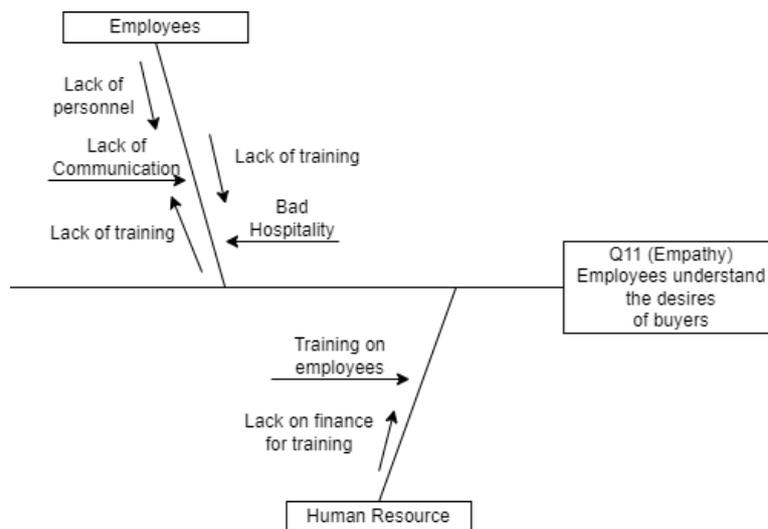


Figure V. Ishikawa Diagram for E1.

- Root cause analysis in R1 (Reliability) Employees perform services reliably and consistently following established procedures

In the last problem in quadrant 1 concentrate here, namely in question R1 there are two root causes, namely service and human resources. In R1, the problem is similar to E1. Customers consider that employees are less able to follow existing procedures in dealing with complaints from customers. This happens because of the lack of communication between employees such as waitresses and chefs in providing information. Then the waitress is not responsive when there are complaints from customers about products such as the level of maturity of the steak that is different from what is desired. On the human resource side, this happens because of the lack of experience of employees in dealing with problems and also the lack of training to know what procedures need to be done

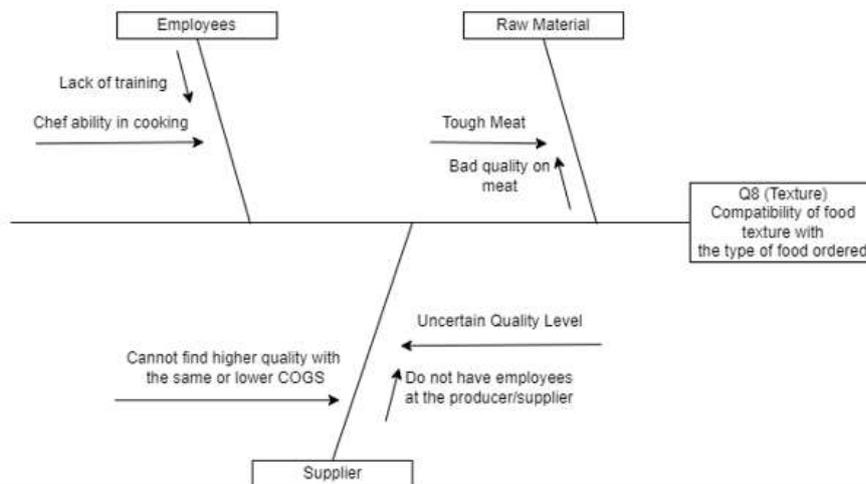


Figure VI. Ishikawa Diagram for R1.



C. Improve Stage.

Table III. Proposed Solution.

No.	Sub-Variable	Root Cause	Proposed Solution
1	Appropriateness of the taste of the food served (T1)	Product: Inappropriate taste, a mistake in the cooking method, and a mistake in seasoning.	Training for chefs in cooking products for the menu provided by XYZ.
		Service: Chef's ability to cook, poor food processing, lack of experience, and lack of training.	Write recommendations for maturity and seasoning so that customers know the specialty of the chef.
		Human resource: a shortage of senior chefs and does not have cost for training.	HR needs to recruit senior chefs who are professionals in cooking and preparing steaks.
2	Compatibility of food texture with the type of food ordered (TX1)	Service: Chef ability in cooking and lack of training.	Training is needed to cook steaks properly so that it becomes a quality product.
		Product: Tough meat and bad quality of the product.	Quality control needs to be improved to maintain the freshness and quality of the product by adding personnel who stand guard at the supplier to find out the quality of the meat. With that XYZ will be easier to control the raw material of the product. Measure the supplier's performance every month in case of non-compliant quality
		Supplier: XYZ cannot find higher quality with the same or lower COGS, uncertain quality level, and does not have employees at the producer/ supplier	
3	Employees understand the desires of buyers (E1)	Service: Lack of communication, lack of personnel, lack of training, and bad hospitality.	Training for all employees is needed.
			Providing special menus every day according to the availability of raw materials and specialty chefs in making the food.
		Human resource: Training on employees and lack of cost for training the employees.	Number of employees needs to be recalculated in order to make communication is effective and will indirectly reduce errors in making products.
4	Employees perform services reliably and consistently following established procedures (R1)	Service: Lack of communication, lack of personnel, and lack of training	Clarifying procedures in handling problems, welcoming customers, and serving customers can be done by using training during new employee recruitment as a guideline or by making preparations before the restaurant opens.

The proposed improvement flowchart in figure VII is based on the solutions listed in table III, with changes marked with a red box. It outlines the changes made to the business process to make it more efficient and effective based on the indicators that are considered important by customers. These changes are aimed at improving the overall customer experience. The placement of XYZ employees at suppliers is also part of these proposed improvements. Quality control refers to the process of evaluating and ensuring the quality of products or services purchased by a company. In this case, the purchasing division will be responsible for carrying out quality control checks on the services they buy from suppliers for the company's needs.

These employees will be responsible for monitoring quality control directly, which will enable them to quickly convey information directly to retailers about any issues. To reduce costs, the company can use an outsourcing system to hire additional employees at the supplier's end or pay the employee who already works at the company since the delivery is only once a week. This will allow the company to quickly find alternative raw materials if necessary and make any necessary adjustments to ensure that the customers receive the highest quality products and services. However, it is necessary to measure the supplier's performance every month in case

of non-compliant quality. Then another addition is to hold comments from customers on the service and products every day to find out the performance of XYZ.

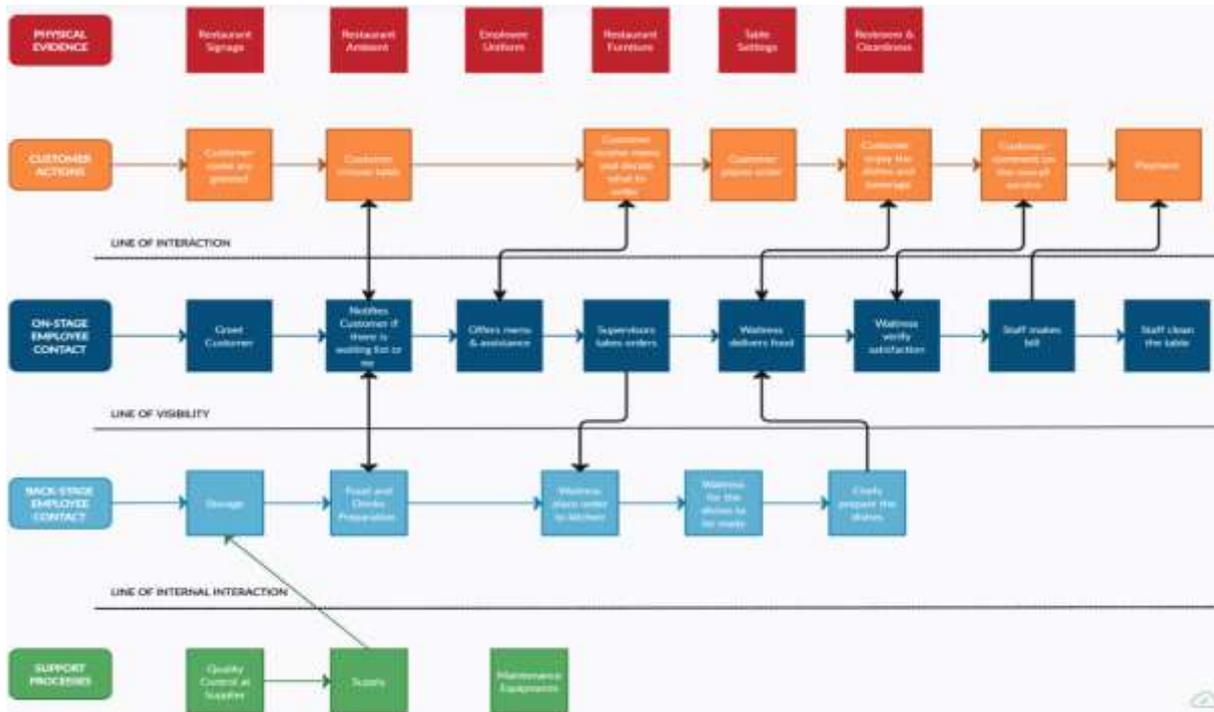


Figure VII. Service Blueprint for Proposed Improvement.

D. Control Stage

The control stage in DMAIC is the final phase of the methodology. It involves maintaining the improvements made to the products and services in the previous stage, improvement. This stage includes the implementation plan and a control check template to monitor and manage the progress of the previously proposed solutions. The aim of this stage is to sustain the improvements and prevent regression to the original state. The control stage is crucial to ensure that the proposed solutions are effectively integrated into the business processes and continuously monitored for desired results. A control chart is a statistical tool used in Six Sigma to monitor, manage, and enhance a process. It gives a visual picture of process behavior across time and makes it easier to spot trends or variations with particular causes. Control charts illustrate if a process is in statistical control, which means it is predictable and consistent, or if it is out of control and needs improvement by putting data points on a graph. Control charts are frequently used in Six Sigma to track critical to quality (CTQ) attributes and assist in locating the source of issues in a process, allowing teams to make fact-based decisions that will lead to process improvement.

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The upper Control Limit (UCL) and Lower Control Limit (LCL) are control limits. In this case, for monitoring fat level, UCL is equal to 18 grams and LCL is 20 grams of fat. As in figure 4.8, if there are products that pass from the LCL and UCL, as marked by the red dot in week 21, XYZ has to reject meat from suppliers because it does not have the right quality of meat. In week 5 and 29, XYZ needs to take precautions so that they do not become defective final products after being processed but still within reasonable limits. Then the markers that are close to the average value are meat that has good meat quality.

In addition, the control chart also serves to see the performance of the products produced by the supplier. If the supplier continues to produce products with inappropriate quality, XYZ requires more activities, such as ensuring the supplier produces good products by showing the performance of the supplier, making a definitive quality standard agreement, or finding another supplier with better quality.



Figure VIII. Example of Control Chart of Fat Level.

5. CONCLUSIONS

Conclusions should include (1) Analysis of the survey shows that there are four variables that need to be improved with the aim of improving quality and customer satisfaction, namely Taste, texture, Empathy, and Reliability, (2) Sub-variables which are prioritized that must be improved is in the "concentrate here" quadrant. According to the results of measurement using IPA, the results of the questionnaire from the customers said there were four sub-variables that had high importance but had low performance as in quadrant 1, (3) Based on the results of the IPA Matrix and reprocessed the root cause using Ishikawa diagram. The causes for four sub-variables to experience underperformance is due to the lack of quality in products raw material and training for employees, (4) Add a job desk to purchasing employees or hire outsourced employees to carry out quality control to check whether the raw materials produced by suppliers are of a quality that is in accordance with XYZ's standards, conduct training for employees for chefs and waitress, and adding more employees

REFERENCES

1. Agrawal, V., Garimella, P. S., Roshan, S. J., & Ghosh, A. K. (2009). Questionnaire survey of physicians: Design and practical use in nephrology. *Indian Journal of Nephrology*, 19(2), 41.
2. Battarjee, A. G., Rana, A. G., Sau, S., & Kongar, E. (2014). Successful Implementation of DMAIC for Pizzeria Restaurant.
3. Crosby, P. B. (1979). *Quality is free-if you understand it*. Winter Park Public Library History and Archive Collection, 4.
4. Dinas Pariwisata dan Kebudayaan. (2021, November 8). Jumlah Usaha Restoran, Rumah Makan, Dan Cafe Berdasarkan Kabupaten/Kota Di Jawa Barat. Retrieved January 28, 2023, from <https://opendata.jabarprov.go.id/id/dataset/jumlah-usaha-restoran-rumah-makan-dan-cafe-berdasarkan-kabupatenkota-di-jawa-barat>
5. Garg, A., & Kumar, J. (2017). Exploring customer satisfaction with university cafeteria food services. An empirical study of Temptation Restaurant at Taylor's University, Malaysia. *European Journal of Tourism, Hospitality and Recreation*, 8(2), 96-106.
6. Gaspersz, V. (2007). *Lean Six Sigma*. Gramedia Pustaka Utama.
7. Griffin, T., & Edwards, D. (2012). Importance–performance analysis as a diagnostic tool for urban destination managers. *Anatolia*, 23(1), 32-48
8. Gronroos, C. (1990). Relationship approach to marketing in service contexts: The marketing and organizational behavior interface. *Journal of business research*, 20(1), 3-11.



9. Heizer, J., Render, B., Munson, C., & Sachan, A. (2017). *Operations management: sustainability and supply chain management*, 12/e.
10. Holweg, M. (2007) The Genealogy of Lean Production. *Journal of Operations Management*, 25, 420-437.
11. Kotler Phillip dan G Armstrong (2016). *Prinsip-prinsip pemasaran (Damos Sihombing : penerjemah)* Jakarta : Erlangga.
12. Lee, Y. L., & Hing, N. (1995). Measuring quality in restaurant operations: an application of the SERVQUAL instrument. *International Journal of Hospitality Management*, 14(3-4), 293-310.
13. Lupiyoadi, R. (2001). *Manajemen pemasaran jasa: Teori dan praktek*.
14. Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of marketing*, 41(1), 77-79. Shah, R., Chandrasekaran, A. and Linderman, K. (2008).
15. Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of Marketing*, 41(1), 77-79.
16. Montgomery, D. C., & Woodall, W. H. (2008). An overview of six Sigma. *International Statistical Review/Revue Internationale de Statistique*, 329-346.
17. Oliver, Riscrd L, (1997), *Satisfaction A Behavioral Perspective On The Consumer*. McGraw-Hill Education, Singapore.
18. Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. 1988, 64(1), 12-40.
19. Pyzdek, T., & Keller, P. A. (2003). *A complete guide for green belts, black belts, and managers at all levels*.
20. Renaldo, S. R. (2018). Penerapan house of quality untuk meningkatkan kepuasan konsumen Kafe Suis Butcher Steak House Jalan Setiabudhi Bandung.
21. Rob, Bangga! Kota Bandung Dinobatkan Sebagai Kota Dengan Makanan Tradisional Terbaik di Asia. (26 May 2022). *Portal Bandung*
22. Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & Sons.
23. Shah, R., Chandrasekaran, A. and Linderman, K. (2008). In pursuit of implementation patterns: The context of lean and six Sigma. *Int. J. Production Research* 46, 23, 6679–6699
24. Shankar, V., Smith, A. K., & Rangaswamy, A. (2003). Customer satisfaction and loyalty in online and offline environments. *International journal of research in marketing*, 20(2), 153-175.
25. Singarimbun, M., & Effendi, S. (1995). *Metode Penelitian Survey*, Jakarta, PT. Pustaka LP3ES Indonesia.
26. Slack, N. (1994). The importance-performance matrix as a determinant of improvement priority. *International Journal of Operations & Production Management*, 14(5), 59-75.
27. Sugiyono. 2018. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*, penerbit Alfabeta, Bandung
28. Tjiptono, F., & Diana, A. (2015). *Pelanggan puas. Tak cukup*, 1.
29. Walker, J. R. (2009). *Introduction to Hospitality Operations*. New York: Prentice Hall.
30. West, B. B., Wood, L., & Harger, V. P. (2006). *Food Service in Institutions*. New York: John Wiley and Sons.
31. Widyastuti, W. (2016). *Tingkat Kepuasan Konsumen Terhadap Produk Restoran Banyumili Resto Yogyakarta*. Yogyakarta: *Program Studi Pendidikan Teknik Boga, Universitas Negeri Yogyakarta*.
32. Worsfold, P. H. I. L. I. P., & Jameson, S. T. E. P. H. A. N. I. E. (1991). *Human resource management: a response to change in the 1990s*. *Strategic Hospitality Management: Theory and Practice for the 1990s*, London: Cassell

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