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**THE IMPACT OF CUSTOMER FEEDBACK ON IMPROVING THE QUALITY OF RESTAURANT SERVICE: CASE OF TURKESTAN**

**Abstract.** *This article presents current research in the field of analyzing customer feedback in the restaurant industry, improving the quality of dishes and improving the level of service. The focus is on the role of customer feedback analysis as a key tool for identifying strengths and weaknesses in restaurant operations in Turkestan city. Modern data analysis methods, including natural language processing (NLP), machine learning, and questionnaires, are considered, which make it possible to effectively collect and analyze information about customer preferences and satisfaction levels.*

*Special attention is paid to the quality of service in restaurants, including aspects such as speed of service, staff empathy and reliability, which have a significant impact on customer satisfaction.*

*In addition, the article provided a comparative analysis of methods for analyzing reviews and introducing innovations in improving the quality of food and service using the example of different countries. It is concluded that the use of technology for feedback analysis, including product quality monitoring, makes it possible to respond to customer requests in a timely manner and increase customer satisfaction, which is critically important for the competitiveness of the restaurant business. For data processing, we utilized the JASP and Taguette software packages, both of which are widely used in contemporary research.*

*The purpose of the study is to analyze customer feedback in order to identify factors affecting their satisfaction with the quality of food and service in the restaurant industry, as well as to develop recommendations for improving key aspects of restaurant operations.*

**Keywords:** *Feedback analysis, restaurant business, quality of service, machine learning, NLP, customer satisfaction*

**Introduction**

Customer feedback analysis is one of the key tools for improving the quality of service and products in the restaurant business. In the context of global competition, restaurants face the need not only to satisfy, but also to anticipate customer expectations. The latest technologies, such as natural language processing (NLP) and machine learning methods, make it possible to automate the

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process of analyzing reviews, revealing hidden trends and preferences. This not only helps to increase customer satisfaction, but also helps restaurants to respond promptly to comments and suggestions [1].

The quality of food remains a central aspect of the customer's perception of restaurant service. Adjusting menus and recipes based on feedback analysis allows you to improve the taste, variety and compliance with the expectations of visitors, which ultimately increases the competitiveness of the institution. At the same time, the quality of service plays an important role: the professionalism of the staff, empathy and speed of response to customer requests directly affect the formation of a positive image of the restaurant [2].

Global experience shows that the use of technology for feedback analysis is becoming the standard in the restaurant industry.

*USA:* Leading restaurant chains such as McDonald's and Starbucks are actively using big data analytics to study customer reviews. Starbucks, for example, uses the My Starbucks Idea platform, which allows you to collect customer suggestions and comments in a crowdsourcing format. The data obtained is analyzed using machine learning methods, which helps the company to quickly implement new recipes and improve service processes. Platforms like Yelp and Google Reviews are also popular in the United States, which help restaurants track their reputation and identify key trends [3].

*Japan:* The emphasis here is on service personalization. For example, the Hamazushi restaurant chain has implemented a system for analyzing orders and reviews, which allows you to adapt the menu to the taste preferences of customers depending on the region or season. Using artificial intelligence and touchscreens to collect feedback directly in restaurants helps to reduce the response time to customer requests [4].

*Europe:* In countries such as the UK and Germany, restaurants focus on environmental friendliness and sustainability. For example, "the Pret a Manger network actively uses feedback to improve the quality of products, paying special attention to sources of supply and food safety. Their program of regular customer surveys through mobile applications allows you to quickly identify shortcomings and adapt business processes [5].

*China:* «The Dianping» platform, an analog of the Western Yelp, is used by restaurants to monitor reviews and rank the popularity of establishments. Technology giants such as Alibaba are integrating analytical tools into restaurant systems, allowing them to predict consumer preferences and improve customer experiences using big data analysis.

These examples clearly demonstrate how innovative technologies help to solve the problems of feedback analysis and increase the competitiveness of restaurants [6].

Despite the obvious advantages of modern technology, automated review analysis methods face a number of limitations, such as the difficulty of interpreting sarcasm, ambiguous expressions, and irony. This highlights the importance of an integrated approach combining technological tools with professional expertise.

The purpose of this study is to study the existing methods of analyzing customer reviews in the restaurant industry, their impact on the quality of dishes, service and customer satisfaction, as well as to determine the role of innovative technologies in increasing consumer loyalty. In particular, attention is paid to the restaurants of Turkestan as an object of research, which makes it possible to identify regional peculiarities and prospects for the development of the industry.

This research is of practical importance because the results of the analysis can be used to optimize the processes of restaurants, increase their competitiveness and create sustainable relationships with customers. Taking into account foreign experience provides unique opportunities for adapting cutting-edge solutions and developing strategies that meet local needs.

**Research objectives:**

- To study modern models of customer feedback analysis, including the use of machine learning, NLP, and traditional approaches such as questionnaires.
- Evaluate the effectiveness of using automated technologies in processing reviews, including identifying hidden trends, preferences, and problem areas in restaurant industry of Turkestan city.
- To investigate the influence of factors such as the quality of dishes, the professionalism of the staff and the speed of service on the level of customer satisfaction and loyalty.
- To conduct a comparative analysis of foreign experience in the field of customer feedback analysis, including practices in the USA, Japan, Europe and China, in order to identify applicable solutions for restaurants in the region.
- To develop recommendations on the introduction of modern methods of feedback analysis to optimize the quality of dishes, improve the level of service and competitiveness of restaurants in Turkestan city.

**Literature review**

**Customer Feedback Analysis**

Customer feedback analysis plays a key role in the restaurant industry, allowing you to identify the strengths and weaknesses of service and food quality. Modern research highlights the effectiveness of using natural language processing (NLP) and machine learning techniques to automatically analyze reviews, which contributes to a deeper understanding of customer needs and increased customer satisfaction [7].

Customer Feedback Analysis is a key tool for understanding customer needs and expectations, as well as for improving the quality of products and services. In recent years, there has been a significant increase in research in this area, driven by the development of natural language processing (NLP) and machine learning technologies [8].

Automated feedback analysis provides the ability to process large amounts of data in real time, which helps to quickly respond to customer requests and increase customer satisfaction. However, such approaches face challenges related to the processing of sarcasm, irony, and ambiguity in texts, which can reduce the accuracy of the analysis [9].

**Improving Food Quality**

Improving the quality of dishes is directly related to the analysis of customer reviews. The systematic collection and analysis of feedback allows restaurants to adapt menus, improve recipes, and raise cooking standards, which ultimately leads to increased customer satisfaction and loyalty [10].

Improving Food Quality is one of the key tasks of the restaurant business and the food industry. This topic attracts the attention of researchers because of its significant impact on customer satisfaction, company competitiveness, and public health [11].

Food safety is one of the key issues in the modern world. This concept covers all stages of the supply chain: from the production of raw materials to the consumption of finished products.

Ensuring food safety not only prevents threats to public health, but also increases consumer confidence, which is especially important for the restaurant business and the food industry [12].

### **Restaurant Service Quality**

The quality of service in restaurants is a critical factor influencing the intention of customers to visit the establishment again. Research shows that aspects such as efficiency, reliability, material elements, empathy and staff confidence significantly affect the perception of customer service quality [13].

The quality of service in restaurants is a critical factor affecting customer satisfaction, loyalty, and the reputation of the establishment. Modern research highlights the multidimensional nature of this concept, including the material elements (infrastructure and interior), the level of staff service, the speed and convenience of service, as well as the ability of the institution to meet the needs and expectations of customers [14].

### **Feedback Models**

There are various feedback analysis models, including manual analysis, automated NLP-based systems, and machine learning. Automated models allow you to efficiently process large amounts of data, identify hidden trends, and provide recommendations for improving the quality of service and meals [15].

Feedback analysis models are an important tool for understanding and evaluating the interactions between organizations and their customers. They are widely used in various fields, including the restaurant business, where understanding the opinions and preferences of customers helps to improve the quality of products and services. In recent years, research and implementation of feedback models have become even more relevant given digitalization, data availability, and new technologies such as machine learning and artificial intelligence. This literature review will examine the main models of feedback analysis and their application in various fields [16].

### **Innovation in improving food quality**

Technological innovations in the food industry are aimed at improving the quality of products at every stage of their production, from the purchase of raw materials to the delivery of ready meals. One of the most significant achievements is the introduction of smart technologies and automation on production lines. For example, using the Internet of Things (IoT) in a monitoring system allows you to monitor the condition of raw materials and finished products, maintaining optimal storage conditions and preventing spoilage [17].

Food safety remains a key aspect in the restaurant industry. In recent years, technologies for product safety control have been actively developing, including intelligent temperature monitoring systems and product origin tracking systems. These systems allow you to monitor compliance with sanitary standards at every stage of the production process, which helps prevent the use of substandard raw materials and minimize the risks of food poisoning. In table 1 shows examples of comparative analysis of feedback processing methods and improvement of food quality in foreign countries [18].

**Table 1 - Comparative analysis of feedback processing methods and improvement of food quality in foreign countries**

<b>Country</b>	<b>Customer Feedback Analysis</b>	<b>Improving Food Quality</b>	<b>Feedback Models</b>	<b>Restaurant Service Quality</b>	<b>Innovations in Improving Food Quality</b>
<b>USA</b>	Text analytics	Organoleptic properties (taste, aroma)	SERVQUAL	Personalized offers based on customer data analysis	Analytical technologies for monitoring product quality
	Machine learning and NLP models	Nutritional value (vitamins, minerals)	Expectation-Confirmation Model	Quick response to feedback via mobile apps	Sustainable development, eco-friendly products
<b>UK</b>	Sentiment analysis	Product safety (control over raw materials and technologies)	Feedback Cycle Model	Staff training, improved communication with clients	Technologies for enhancing product safety and quality
	Survey and questionnaire models	Storage technologies and product logistics	Use of technological solutions for feedback processing	Modern service methods (digital interfaces, mobile orders)	Automation of food preparation processes
<b>Germany</b>	Feedback analysis via platforms	Product safety control	SERVQUAL	Highly qualified staff	Innovations in production processes (smart devices)
	Machine learning application	Data analytics for improving food quality	Expectation-Confirmation Model	Intensive staff training and certification	Data-driven optimization of product quality
<b>Japan</b>	NLP and text analytics models	Focus on organoleptic characteristics	Japanese quality service model (Kaizen)	Attention to details, individualized approach to each client	Sustainable practices in ingredients and packaging
	Assessment through questionnaires	Innovative cooking methods (e.g., molecular gastronomy)	Feedback cycle models	Innovative methods (e.g., robotic service systems)	Use of new technologies to improve food perception

Source: Author's own, based on the literature [19], [20], [21], [22]

This comparative analysis demonstrates how different countries use innovative and traditional methods to analyze feedback, improve food quality and customer service in the restaurant industry.

Feedback analysis models play an important role in improving the quality of service and products in restaurants and other businesses. Modern analysis methods such as text analytics, machine learning, and the use of surveys can significantly improve the accuracy and efficiency of feedback analysis. The implementation of such models helps restaurants and other companies to respond to customer needs in a timely manner, optimize processes and increase customer satisfaction.

#### **Research hypotheses:**

Hypothesis 1: Systematic analysis of customer reviews received through various digital platforms (Google Reviews, 2GIS) contributes to improving the quality of dishes and the level of service in restaurants in Turkestan.

Hypothesis 2: The active use of data on customer preferences and reviews to adapt the menu and improve service leads to increased customer loyalty and an improvement in the overall reputation of the restaurants in Turkestan.

#### **Materials and methods**

This study used combined analysis methods to evaluate customer feedback, the quality of dishes, and the level of service in restaurants, cafes, and bars in Turkestan. The methodology was based on quantitative and qualitative approaches, including data collection, processing and analysis. The main stages of the study are presented below:

##### **Data collection**

The following sources were used to study customer reviews:

- Digital platforms (Google Reviews, 2GIS) for analyzing text reviews
- Internal data of restaurants, including the results of customer surveys and questionnaires
- Open data on the dynamics of the number of catering establishments in Turkestan for 2018-2023

The total amount of data collected was:

- More than 7,300 reviews, including 6,700 positive and 600 negatives
- Statistical information about the categories of establishments (restaurants, cafes, bars) and their average rating

##### **Evaluation criteria**

The following indicators were used to assess the quality of food and service:

- Average rating based on reviews
- The percentage of positive and negative reviews
- Frequency of mentions of key issues (long waiting times, lack of service, quality of food)

##### **Comparative analysis**

A comparative analysis of methods and approaches in different countries was conducted to identify best practices:

Data on feedback approaches and innovations in the USA, Great Britain, Germany and Japan were used - Tables have been built for comparative analysis of key parameters, including feedback models, innovations in improving the quality of food and the level of service

### **Limitations of the study**

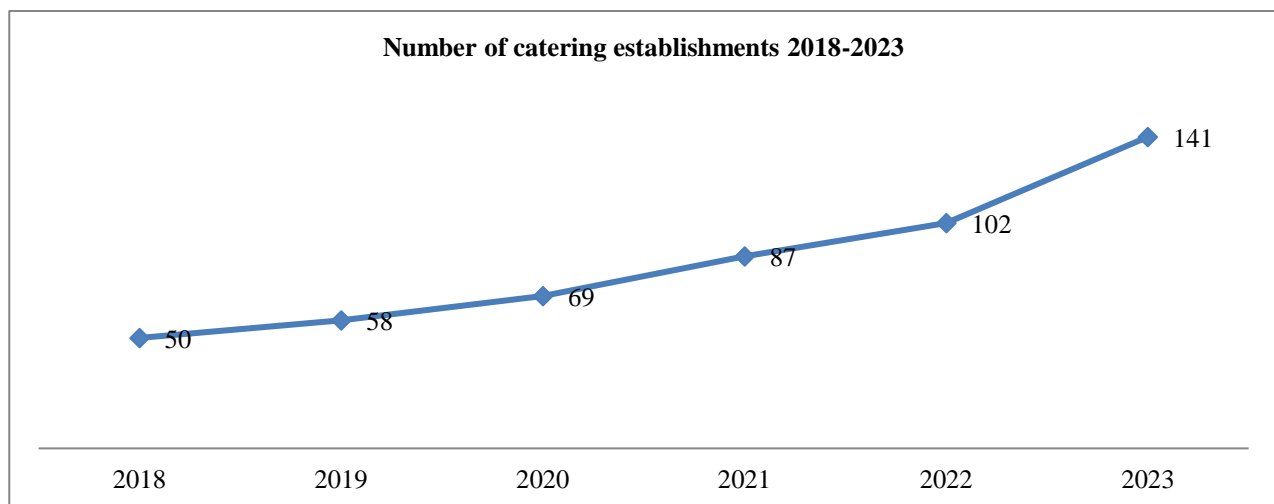
The study has several limitations:

- The data is collected only for the city of Turkestan, which may limit their applicability to other regions
- NLP text processing and interpretation may encounter problems with ambiguity, irony, and sarcasm

The methodology of this study provided a comprehensive approach to analyzing customer reviews, which made it possible to identify key problems and offer practical recommendations for improving the quality of service and dishes in the establishments of the city of Turkestan.

### **Results**

The analysis of the quality of service and customer satisfaction in the field of catering plays an important role in increasing the competitiveness and efficiency of establishments. In recent years, there has been a steady increase in the number of restaurants, cafes and bars in the city of Turkestan, which increases the need to study the factors influencing consumers' perception of the quality of services provided. This study examines the dynamics of the number of establishments and assesses customer satisfaction in key aspects such as the quality of service, the quality of food and atmosphere, with an emphasis on negative reviews that can serve as an indicator of existing problems and areas for improvement. The analysis process is based on data for the period 2018-2023, in order to identify trends and develop recommendations for improving the quality of service in the institutions of the city of Turkestan [23].



**Figure 1 - Dynamics of the number of catering establishments in Turkestan, 2018-2023**

*Source: Author's own, based on data from the stat.gov.kz website*

The graph illustrates the growth dynamics of the number of catering outlets in the period from 2018 to 2023.

- In 2018, the number of establishments was 50.
- In 2019, there was a slight increase to 58 establishments.
- In 2020, the number increased to 69.
- In 2021, the figure reached 87.
- In 2022, the number of catering outlets increased to 102.
- By 2023, this figure has increased significantly to 141 establishments.

The general trend shows a steady increase in the number of catering outlets over the specified period.

**Table 2 – Restaurants, cafes and bars in Turkestan (by category and type of reviews) for 2018-2023**

Category	Establishments	Total Reviews	Positive Reviews (Rating 4-5)	Negative Reviews (Rating 1-3)	Average Rating
Restaurants	55	3,000	2,750	250	4.8
Cafes and Cafeterias	55	2,500	2,300	200	4.7
Bars	31	1,800	1,650	150	4.6
<b>Total</b>	<b>141</b>	<b>7,300</b>	<b>6,700</b>	<b>600</b>	<b>4.7</b>
<i>Source: Author's own, based on the Google Reviews, 2GIS (Taguette program was used for processing) [24], [25]</i>					

The table shows three categories of establishments: restaurants, cafes and cafeterias, as well as bars. The total number of establishments is 141. Restaurants and cafes occupy an equal number of positions (55 each), and the bars are the least — 31.

In total, 7,300 reviews have been left about the establishments. Restaurants account for the majority of reviews (3,000), followed by cafes and cafeterias (2,500), and bars have the least reviews (1,800).

Of the total number of reviews, 6,700 (91.8%) are positive (rating 4-5).

There are significantly fewer negative reviews (rating 1-3) — 600 (8.2%). This indicates a high degree of customer satisfaction.

Restaurants have the highest percentage of positive reviews (91.7%), followed by cafes and cafeterias (92%), and bars have a slightly lower percentage (91.7%).

Restaurants have the highest average rating — 4.8, followed by cafes and cafeterias — 4.7, and bars with a rating of 4.6 complete the list. This indicates that restaurants provide the highest quality service and products according to visitors.

The average rating for all establishments is 4.7, which indicates a high level of customer satisfaction.

The most popular and highly rated category are restaurants, which may be related to the quality of the dishes and the level of service. Cafes and cafeterias also show good results by providing high-quality service. Despite the smaller number of bars, their average rating and the share of positive reviews remain at a decent level. The overall high average rating indicates the successful operation of the establishments and the positive customer experience.

The modern restaurant and hotel business market is characterized by high competition and rapid development, which leads to constant changes in consumer expectations. With a wide choice of establishments, customer reviews are becoming one of the key factors influencing the reputation and success of a business. However, despite the efforts of the owners and managers, negative reviews remain an integral part of the consumer experience. They can relate to various aspects, from the quality of food and service to the atmosphere and cleanliness of the premises.

This table shows approximate figures of negative reviews concerning various categories of establishments — restaurants, cafes, cafeterias and bars. The compiled information will help



analyze the most common problems faced by consumers, as well as identify key areas for service improvement.

**Table 3 - The number of frequently occurring negative reviews for 2018-2023 in the service sector in the city of Turkestan**

Category	Negative Reviews	Number of Negative Reviews
Restaurants	The food did not meet expectations. Dishes were served cold, and the service was lacking. Staff was inattentive.	15
	Waited too long for the order. Portions were small, and the quality of the food did not meet high expectations.	12
	Very noisy, impossible to have a peaceful dinner. Service was not at its best — waiters were busy with other tasks.	10
	Limited menu, expected more from a place with such a name. Ingredients were not fresh.	8
	Staff was incompetent, and the dishes were not served as expected. Ingredients were not fresh.	6
	Disliked the interior and overall atmosphere. Very small portions for the price.	5
	Food was too greasy and unappetizing. Service was poor, and the waiters were unfriendly.	7
	The restaurant was dirty, tables were not cleaned, and the atmosphere did not meet expectations.	4
Cafés	Pizza was overcooked, and the sauce was too spicy. Very disappointed with the food quality.	10
	Staff was careless and did not pay enough attention to customers. Would not recommend this place.	12
	Food was cold and did not taste as expected. The café did not live up to its reputation.	9
	Poor service quality, waited too long for our order. The table was dirty.	8
	Prices were high, and the quality of the food did not match the claimed standards. Small portions and unappealing taste.	7
	Waited a long time for the order, and the dish arrived cold. Very low level of service.	5
Cafeterias	Pizza was overcooked, and the sauce was too spicy. Very disappointed with the food quality.	8
	Staff was careless and did not pay enough attention to customers. Would not recommend this place.	7
	Food was cold and did not taste as expected. The cafeteria did not live up to its reputation.	6
	Poor service quality, waited too long for our order. The table was dirty.	5
	Prices were high, and the quality of the food did not match the claimed standards. Small portions and unappealing taste.	4
	Waited a long time for the order, and the dish arrived cold. Very low level of service.	3

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Bars	Karaoke lacked the necessary equipment, and songs did not sync with the lyrics. Very disappointed.	5
	Staff was rude and inattentive, and the atmosphere was unpleasant.	8
	Service was very slow. Ordered drinks and had to wait for 30 minutes.	7
	The bar did not meet expectations. Cocktails were watery, and the atmosphere was uninviting.	6
	Menu was not diverse, and the food quality was disappointing. Expected more from this place.	4
	Prices were high, and portions were small. Service quality was insufficient, and waiters did not smile.	5
<b>Total</b>		<b>180</b>
Source: Author's own, based on the Google Reviews, 2GIS ( <i>Taguette</i> program was used for processing) [24], [25]		

*Total number of negative reviews:*

- Restaurants: 64 reviews
- Cafe: 48 reviews
- Cafeteria: 33 reviews
- Bars: 35 reviews

This table is calculated based on the prevalence of the problems mentioned in the reviews. This table allows you to clearly see the division of negative reviews by category of establishments, which helps to identify problems specific to each group.

**Table 4 - Distribution of Negative Reviews by Category of Establishments in the city of Turkestan**

<b>Keyword</b>	<b>Percentage (%)</b>
Food	29.27%
Service	24.39%
Prices	19.51%
Atmosphere	14.63%
Interior	2.44%
Menu	9.76%
Source: Author's own, based on the Google Reviews, 2GIS ( <i>Taguette</i> program was used for processing) [24], [25]	

The largest number of mentions is related to food (29.27%), followed by service (24.39%) and prices (19.51%). The interior and menu are mentioned less frequently, amounting to 2.44% and 9.76%, respectively

Based on the results of this table, a survey was conducted among residents of the city of Turkestan. The study identified the areas that received the highest percentages of negative reviews, namely:

- Food (29.27%)
- Service (24.39%)
- Prices (19.51%)

These aspects were identified as the main reasons for the respondents' dissatisfaction, which makes it possible to identify key areas for improvement in the field of hotel and restaurant services in Turkestan. The survey was aimed at collecting more detailed information about the preferences

and problems faced by local residents.

A survey conducted among residents of Turkestan in order to assess satisfaction with the quality of service, dishes, prices, as well as the atmosphere and design in restaurants, cafes and bars of the city. The respondents rated various aspects on a scale from 1 to 5, where 1 is very unsatisfactory (or low quality), and 5 is very satisfactory (or high quality).

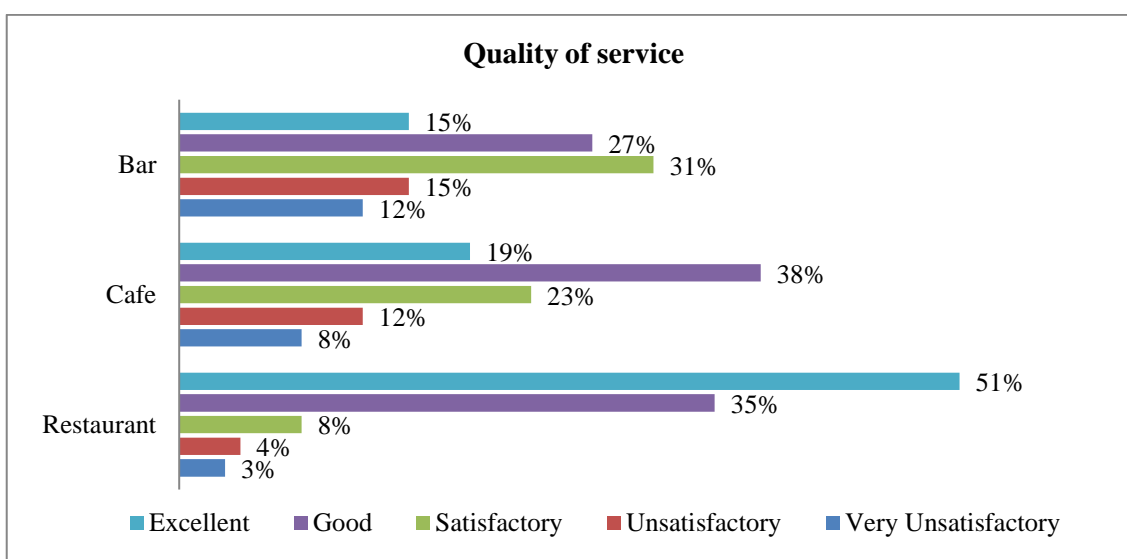
**Table 5 - Survey on Customer Satisfaction in Restaurants, Cafes, and Bars in Turkestan**

Category	Service Quality	Food Quality	Price Quality	Atmosphere and Design Quality
<b>Restaurant</b> <b>Café</b> <b>Bar</b>	How satisfied are you with the service quality in restaurants, cafes, and bars in Turkestan?	How do you rate the food quality in restaurants, cafes, and bars in Turkestan?	How do you rate the prices relative to the food and service quality in restaurants, cafes, and bars in Turkestan?	How much did you like the atmosphere and design in restaurants, cafes, and bars in Turkestan?
Rate from	1 to 5, where (1) - is very unsatisfactory and (5) - is very satisfactory			
Source: Author's own				

This table presents the results of an assessment of the quality of service in restaurants, cafes and bars in the city of Turkestan, obtained during a survey among local residents.

**Table 6 – Assessment of Quality of service**

Rate from	1	2	3	4	5	Total
Category	<i>Very Unsatisfactory</i>	<i>Unsatisfactory</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>	
Restaurant	4 (3%)	5 (4%)	10 (8%)	45 (35%)	66 (51%)	130
Cafe	10 (8%)	15 (12%)	30 (23%)	50 (38%)	25 (19%)	130
Bar	15 (12%)	20 (15%)	40 (31%)	35 (27%)	20 (15%)	130
Source: Author's own, based on the results of the survey (JASP program was used for processing)						



**Figure 2 – Diagram of Service Quality Assessment**

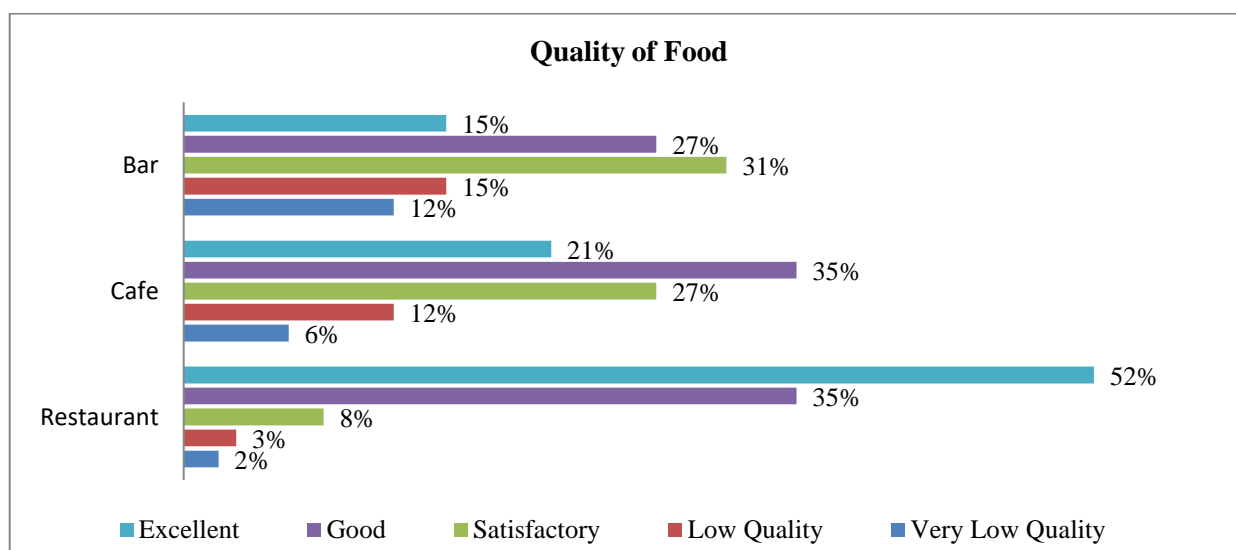
*Source: Author's own, based on the results of the survey (JASP program was used for processing)*

Quality of service In restaurants in Turkestan, the majority of respondents highly rate the quality of service, with 51% of participants rating "Excellent" and 35% rating "Good". — However, there is also a small proportion of participants who remained dissatisfied (7% chose the ratings "Very unsatisfactory" and "Unsatisfactory"). In the cafe, despite the good ratings (38% — "Good" and 19% — "Excellent"), there is a more significant percentage of people who rated the service as "Unsatisfactory" or "Very unsatisfactory" (20% in total). The quality of service in bars also receives a variety of ratings: 15% of respondents chose the ratings "Very unsatisfactory" and "Unsatisfactory", but the majority still noted the service as "Good" and "Excellent" (35% and 51%, respectively).

**Table 7 – Assessment of Quality of food**

Rate from	1	2	3	4	5	Total
Category	<i>Very Unsatisfactory</i>	<i>Unsatisfactory</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>	
Restaurant	3 (2%)	4 (3%)	10 (8%)	45 (35%)	68 (52%)	130
Cafe	8 (6%)	15 (12%)	35 (27%)	45 (35%)	27 (21%)	130
Bar	15 (12%)	20 (15%)	40 (31%)	35 (27%)	20 (15%)	130

Source: Author's own, based on the results of the survey (JASP program was used for processing)



**Figure 3 – Diagram of Food Quality Assessment**

*Source: Author's own, based on the results of the survey (JASP program was used for processing)*

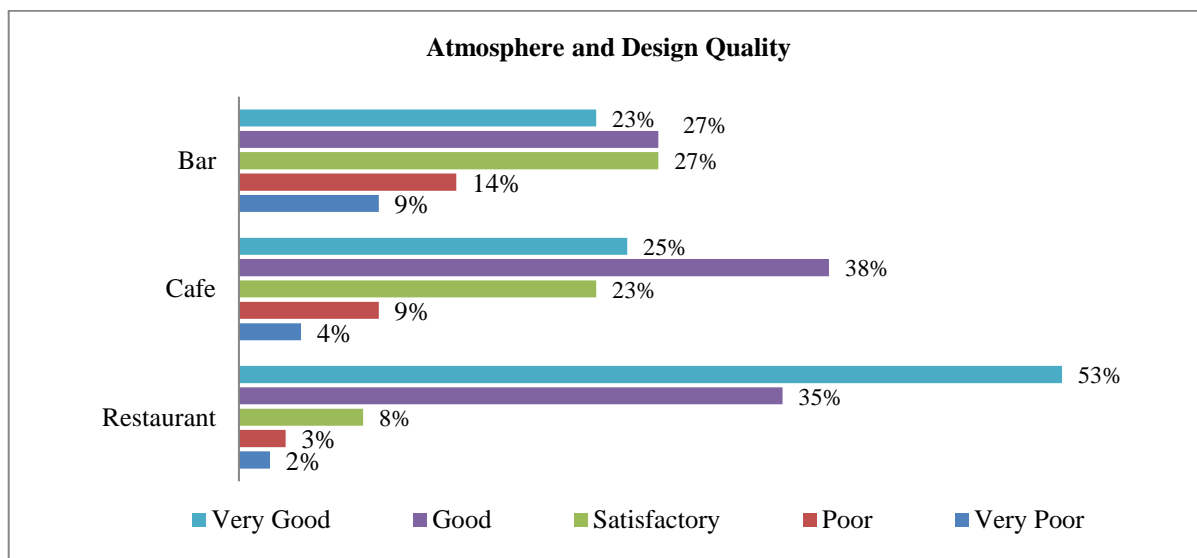
The quality of food in restaurants, the majority of respondents rate the quality of the dishes highly, with 52% choosing the rating "Excellent" and 35% — "Good". 2% of the participants remained dissatisfied with the quality of the dishes. In cafes, grades are distributed more evenly, with the largest share of "Good" (35%) and "Satisfaction" (27%) ratings. 6% of the respondents rated the quality of the dishes as "Very low". The quality of the dishes in the bars also received a variety of ratings, but the majority rated them as "Good" and "Excellent" (35% and 31%,

respectively), while 27% of the participants chose the rating "Satisfaction".

**Table 8 – Assessment of Atmosphere and Design Quality**

Rate from	1	2	3	4	5	Total
Category	<i>Very Unsatisfactory</i>	<i>Unsatisfactory</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>	
Restaurant	2 (2%)	4 (3%)	10 (8%)	45 (35%)	69 (53%)	130
Cafe	5 (4%)	12 (9%)	30 (23%)	50 (38%)	33 (25%)	130
Bar	12 (9%)	18 (14%)	35 (27%)	35 (27%)	30 (23%)	130

Source: Author’s own, based on the results of the survey (JASP program was used for processing)



**Figure 4 – Diagram of Atmosphere and Design Quality Assessment**

Source: Author’s own, based on the results of the survey (JASP program was used for processing)

The quality of the atmosphere and design in restaurants, the vast majority of participants rate the atmosphere and design as "Excellent" (53%) and "Good" (35%). Only 5% of respondents described the atmosphere as "Bad" or "Very bad." The cafe also has a positive rating (38% — "Good", 25% — "Excellent"), but 13% of participants chose negative ratings ("Bad" and "Very bad"). In bars, 50% of the participants rated the atmosphere as "Good" or "Excellent," while 23% chose lower ratings.

**Table 9 – Assessment of Price Quality**

Rate from	1	2	3	4	5	Total
Category	<i>Very Unsatisfactory</i>	<i>Unsatisfactory</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>	
Restaurant	3 (2%)	6 (5%)	15 (12%)	40 (31%)	66 (51%)	130
Cafe	7 (5%)	10 (8%)	35 (27%)	45 (35%)	33 (25%)	130
Bar	12 (9%)	18 (14%)	35 (27%)	40 (31%)	25 (19%)	130

Source: Author’s own, based on the results of the survey (JASP program was used for processing)



**Figure 5 – Diagram of Price Quality Assessment**

*Source: Author’s own, based on the results of the survey (JASP program was used for processing)*

Price quality in restaurants, as in other categories, the majority of respondents highly rate the price-quality ratio (31% chose "Good", 51% — "Excellent"). However, 7% of the participants still noted the low quality of the prices. In cafes, the distribution of ratings is also relatively positive, with the majority at the levels of "Good" (35%) and "Excellent" (25%), but 13% of respondents chose lower grades. In bars, the price-quality ratio has received more diverse ratings, with the largest shares being "Good" (31%) and "Satisfactory" (27%).

The survey results show that residents of Turkestan are generally satisfied with the quality of service, dishes, atmosphere and prices in restaurants, cafes and bars. The largest number of positive reviews was received in the categories of service quality and food quality, which indicates a high level of customer service and gastronomic quality in these establishments. It is worth noting that in some categories, especially in cafes and bars, there is a certain proportion of respondents who expressed dissatisfaction, mainly with the quality of service and the price-quality ratio. This may indicate the need to improve service and adjust pricing policies, especially in cafes and bars.

**Discussion and recommendations**

Public catering enterprises in Turkestan have a stable customer base, but they must continue to work on improving the quality of service and optimizing prices in order to maintain a high level of customer satisfaction.

Using NLP methods to analyze feedback: How customer reviews help improve the quality of service in the restaurant business, we can offer the following recommendations on the steps using the natural language processing (NLP) model. These steps include data collection, processing, analysis, and implementation of the insights into business practices.

**Step 1: Data Collection and Preparation**

Collect reviews from various online platforms such as Google Reviews, 2GIS, TripAdvisor, and others that contain multiple customer reviews of restaurants, cafes, and bars.

Interpretation: Reviews are a valuable source of information for analysis, but they can be unstructured and contain a lot of noise. Therefore, it is important to prepare and clear the data in advance of non-essential elements, such as advertising messages or uninformative comments.

**Step 2: Data Cleanup**

Apply data cleanup techniques such as removing stop words, punctuation marks, numbers, and incorrect characters.

Interpretation: Clearing the data allows you to bring the text to a format that will be convenient for further processing. Stop words (for example, "and", "on", "with") and unnecessary characters do not carry meaningful information, and their removal speeds up the analysis process. It also helps to avoid skewing the results.

**Step 3: Tokenization**

Split the text into separate tokens (words or phrases) that can be analyzed.

Interpretation: Tokenization allows you to split text into smaller units that are easier to process. Each token can represent a separate word or phrase, which makes its analysis more accurate and detailed. This is one of the main steps in NLP, which prepares data for further steps.

**Step 4: Lemmatization and stemming**

Use lemmatization or stemming methods to bring words to the base or root form.

Interpretation: Lemmatization and stemming make it possible to reduce the number of different forms of a single word, which makes the analysis more universal. For example, "portion", "portions" and "portion" can be reduced to one basic form, which makes it easier to classify and calculate the frequency of occurrence of keywords.

**Step 5: Sentiment Analysis**

Use tonality analysis models to classify reviews as positive, negative, or neutral.

Interpretation: Tonality analysis models help determine which mood prevails in a review. For example, if a customer writes "The service was terrible", this will be classified as a negative tone. The analysis of tonality helps to identify weaknesses in the service, such as poor service or poor quality of dishes, and prioritize dealing with these problems.

**Step 6: Extract key themes and aspects**

Apply keyword extraction techniques and themes to understand which aspects of the restaurant (food, service, atmosphere, etc.) are most frequently mentioned in reviews.

Interpretation: Extracting key themes helps to understand which elements of the restaurant are important to customers. For example, if most reviews mention "noisy" or "long wait", this may be an indicator that the atmosphere needs to be improved or service needs to be accelerated.

**Step 7: Classify reviews by category**

Classify reviews into various categories, for example, "food quality", "service", "pricing policy", "atmosphere", etc.

Interpretation: This classification allows you to determine exactly which aspects of the restaurant require improvement. For example, if most of the reviews are negative in the "food quality" category, then the restaurant should pay attention to improving recipes or the quality of ingredients.

**Step 8: Training the model on data**

Train a machine learning model on the collected data to improve automatic feedback analysis in the future.

Interpretation: Based on the previous steps, you can train a machine learning model that will automatically classify reviews by category and tonality. This will increase the effectiveness of the analysis and allow you to quickly respond to changes in customer sentiment.

**Step 9: Generate reports and recommendations**

Generate reports based on analysis to identify areas for improvement and propose changes

aimed at improving the quality of service and meals.

Interpretation: After analyzing the data, the NLP model can automatically generate reports with recommendations for business. This allows restaurant owners to make informed decisions about what changes need to be made to the menu, the staff, or other aspects of the establishment.

***Step 10: Implement Improvements***

Implement changes based on the insights gained and monitor the results.

Interpretation: After the improvements are implemented, it is important to monitor how this affects the reviews and overall rating. Using NLP in this process allows you to constantly adapt the strategy based on current data and improve the quality of products and services on a long-term basis.

**Conclusion**

The dynamics of growth in dining establishments in Turkestan from 2018 to 2023 show a steady increase. In 2018, there were 50 establishments, which rose to 141 by 2023. Overall, positive reviews dominated, accounting for 91.8% (6,700 reviews), while negative reviews constituted 8.2% (600). The average rating was 4.7, with restaurants scoring 4.8, cafes 4.7, and bars 4.6.

Negative reviews were primarily related to food quality (29.27%), service quality (24.39%), pricing issues (19.51%), and ambiance (14.63%). Specific complaints included cold dishes, low-quality ingredients, long waiting times, and high prices.

An analysis of best practices in countries such as the United States, the United Kingdom, Germany, and Japan revealed advanced methods such as improving client feedback systems, enhancing food quality control, and optimizing service standards. For dining establishments in Turkestan, the key recommendations include improving food quality, revising pricing policies, enhancing service through employee training, and upgrading client feedback mechanisms. Additionally, leveraging digital platforms to implement innovations and developing systems that account for customer demands are critical measures for improvement.

The use of NLP methods to analyze customer reviews in the restaurant business makes it possible to effectively extract insights from large amounts of unstructured data, identify problems in service and food quality, and provide accurate recommendations for improving the operation of the establishment.

This article provides a detailed analysis of the role of customer feedback in improving the quality of service and dishes in the restaurant industry. Modern methods of feedback analysis are considered, including the use of natural language processing (NLP) technologies and machine learning models, as well as their impact on the competitiveness of restaurants. The analysis showed that the systematic collection and processing of reviews makes it possible to identify the main problems in a timely manner, adapt the menu and improve service standards, which ultimately increases customer satisfaction and loyalty.

Special attention is paid to the role of the quality of food and service in shaping a positive customer experience. The results of the study emphasize that the use of innovative technologies, such as smart monitoring systems and *IoT*, contributes to maintaining a high level of food quality and food safety.

In addition, a comparative analysis of practices from different countries has shown that the successful implementation of feedback analysis models and innovative approaches is directly related to national characteristics, culture and customer expectations. This allows restaurants not only to satisfy existing requests, but also to anticipate changes in customer preferences.



The findings confirm the hypothesis that the use of data obtained from reviews significantly enhances the reputation of institutions and contributes to the growth of their popularity. The introduction of modern technologies in feedback analysis and food quality management is becoming a key tool for the long-term development of the restaurant business.

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**ТҰТЫНУШЫЛАРДЫҢ ПІКІРЛЕРІНІҢ МЕЙРАМХАНА ҚЫЗМЕТІНІҢ  
САПАСЫН АРТТЫРУҒА ӘСЕРІ: ТҮРКІСТАН ҚАЛАСЫ МЫСАЛЫНДА**

*Аңдатпа.* Бұл мақалада тұтынушылардың пікірлерінің мейрамхана бизнесінде қызмет сапасын арттыру құралы ретінде қолдану жолдары жайлы зерттеу нәтижелері ұсынылған. Негізгі назар Түркістан қаласының тұтынушыларының кері байланысын талдау арқылы қала мейрамханаларының күшті және әлсіз жақтарын анықтауға, сондай-ақ тағамдар мен қызмет көрсетудің сапасын жақсартуға аударылған. Деректерді өңдеудің заманауи тәсілдері қарастырылған, соның ішінде табиғи тілдерді өңдеу (NLP), машиналық

оқыту және сауалнама әдістері, олар тұтынушылардың талғамдары мен қанағаттану деңгейін жүйелі түрде зерттеуге мүмкіндік береді.

Зерттеуде Түркістан қаласының қоғамдық тамақтандыру орындарындағы қызмет көрсету сапасының негізгі параметрлеріне ерекше көңіл бөлінген, соның ішінде тапсырыстарды орындау жылдамдығы мен дәлдігі, қызметкерлердің кәсібилігі мен жауапкершілігі, сондай-ақ қызметтердің сенімділігі.

Әртүрлі елдердің мейрамханаларында тұтынушылардың пікірлерін өңдеу және қызмет көрсету мен тағам сапасын жақсарту бойынша инновациялық шешімдерді енгізу әдістеріне салыстырмалы талдау жасалды.

Алынған деректер негізінде тұтынушылардың сұраныстарына жедел жауап беру және олардың қанағаттану деңгейін арттыру үшін кері байланыс талдау технологияларын Түркістан қаласының қоғамдық тамақтандыру орындарында қолданудың маңыздылығы туралы қорытынды жасалды. Бұл мейрамханалардың бәсекеге қабілеттілігін нығайтуға ықпал етеді. Жиналған ақпаратты өңдеу үшін JASP және Taguette бағдарламалық құралдары пайдаланылды, олар қазіргі зерттеулерде деректерді сапалы талдауды қамтамасыз етеді.

Зерттеудің мақсаты – тұтынушылардың тағамдар мен қызмет көрсету сапасына қанағаттануына әсер ететін факторларды анықтау және мейрамханалар жұмысының негізгі аспектілерін жетілдіруде табиғи тілдерді өңдеу (NLP), машиналық оқыту әдісін кеңінен қолдану бойынша ұсыныстар берілген.

**Кілт сөздер:** Кері байланысты талдау, мейрамхана бизнесі, қызмет көрсету сапасы, машиналық оқыту, NLP, тұтынушылардың қанағаттануы

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### **ВЛИЯНИЕ ОТЗЫВОВ КЛИЕНТОВ НА ПОВЫШЕНИЕ КАЧЕСТВА РЕСТОРАННОГО ОБСЛУЖИВАНИЯ: НА ПРИМЕРЕ ГОРОДА ТУРКЕСТАН**

**Аннотация.** В статье представлены результаты исследования роли клиентских отзывов в повышении качества услуг ресторанного бизнеса. Основное внимание уделяется выявлению сильных и слабых сторон ресторанов города путем анализа отзывов потребителей города Туркестан, а также улучшению качества блюд и услуг. Рассматриваются современные подходы к обработке данных, включая методы обработки естественного языка (NLP), машинное обучение и анкетирование, которые позволяют систематически изучать предпочтения клиентов и уровень их удовлетворенности.

В исследовании особое внимание уделено основным параметрам качества обслуживания в местах общественного питания города Туркестан, включая скорость и точность выполнения заказов, профессионализм и ответственность сотрудников, а также надежность услуг. Проведен сравнительный анализ методов обработки клиентских отзывов и внедрения инновационных решений для улучшения качества питания и обслуживания в ресторанах разных стран.

На основании полученных данных сделан вывод о важности использования технологий анализа обратной связи в предприятиях общественного питания города Туркестан для оперативного реагирования на запросы потребителей и повышения уровня их

удовлетворенности. Это, в свою очередь, способствует укреплению конкурентных позиций ресторанных предприятий. Для обработки собранной информации использовались программные средства JASP и Taguette, обеспечивающие качественный анализ данных в современных исследованиях.

Цель исследования является выявление факторов, влияющих на удовлетворенность потребителей качеством блюд и обслуживания, а также разработка рекомендаций по широкому применению методов обработки естественного языка (NLP) и машинного обучения для улучшения ключевых аспектов работы ресторанов.

**Ключевые слова:** анализ обратной связи, ресторанный бизнес, качество обслуживания, машинное обучение, НЛП, удовлетворенность клиентов