The applying of QFD-Analysis

to increase patient satisfaction in helthcare organisations

La aplicación de QFD-Analysis para aumentar la satisfacción del paciente en las organizaciones sanitarias

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Abstract

The article presents research on the study of “consumer voice” in the outpatient sector of a medical organization. The results of a survey of the patient and the formation of the patient’s voice in the “technical characteristics” are presented. The basic needs of patients receiving medical care are investigated. It was clarified what qualities patients would like to see in the process of providing medical care. Interviewed more than 150 people, received 450 original “consumer votes” on the procedure for obtaining planned medical care in the primary health care - polyclinic. Benchmarking was carried out with the nearest competitors of the medical institution. The results of the study are especially relevant in a pandemic and are of interest to medical institutions implementing the Lean Polyclinic system. In the course of the study, a method of structuring quality functions and interviewing patients was used. As a result of the study, measures were proposed to increase patient satisfaction.

Key words: Healthcare, Quality of healthcare, QFD, Quality Function Deployment, House of Quality,HOQ, voice of customer, benchmarking, patients requirement, patient survey, pandemic, empathy.

Resumen

El artículo presenta una investigación sobre el estudio de la “voz del consumidor” en el sector ambulatorio de una organización médica. Se presentan los resultados de una encuesta del paciente y la formación de la voz del paciente en las “características técnicas”. Se investigan las necesidades básicas de los pacientes que reciben atención médica. Se aclaró qué cualidades les gustaría ver a los pacientes en el proceso de brindar atención médica. Entrevistó a más de 150 personas, recibió 450 “votos de los consumidores” originales sobre el procedimiento para obtener atención médica planificada en la atención primaria de salud - policlínica. El benchmarking se realizó con los competidores más cercanos de la institución médica. Los resultados del estudio son especialmente relevantes en una pandemia y son de interés para las instituciones médicas que implementan el sistema Lean Policlínica. En el transcurso del estudio se utilizó un método de estructuración de funciones de calidad y entrevista de pacientes. Como resultado del estudio, se propusieron medidas para aumentar la satisfacción del paciente.

Palabras clave: Atención médica, calidad de la atención médica, QFD, implementación de funciones de calidad, casa de calidad, HOQ, voz del cliente, evaluación comparativa, requisitos de los pacientes, encuesta de pacientes, pandemia, empatía.

Introduction

Modern trends in the socio-economic development of society, digitalization and increasing demands on the part of the population for the quality of medical care, focused on the needs of the patient, the organization of care taking into account the principles of ergonomics and adherence to the volume of the working space, the creation of a positive image of the medical worker require the implementation of the principles of lean production in order to increasing patient satisfaction with the availability and quality of medical care, efficient use of health care resources. The organization of a fast and flexible medical structure is especially important in the context of the onset of the coronavirus pandemic.

The relevance is also supported by the further implementation of the federal project on improving the primary care system “Lean Polyclinic” for 2019-2024. 85 subjects of the Russian Federation will participate in the creation and replication of the “New Model of a Medical Organization Providing

Primary Health Care", more than 6.5 thousand clinics will use lean technologies in their activities.

In this regard, the development of methodological support for assessing the quality of medical services in the health care system in order to increase patient satisfaction is becoming relevant.

It should be noted that the quality of medical services is an extremely complex and multidimensional phenomenon and it has an individual context.

So, A. Donabedian8 believes that the quality of medical care consists in applying the achievements of modern medical science and healthcare practice on the principle of achieving the maximum possible benefit without increasing the risk of treatment.

A modern understanding of quality medical care, according to the conclusion of the WHO expert group, is that - each patient should receive a set of diagnostic and therapeutic care that would lead to optimal results for this patient's health in accordance with the level of medical science and such biological factors, like his age, disease, concomitant diagnosis, reaction to the selected treatment, etc [3].

Structural quality - a component of a medical service that describes the conditions for its provision.

Purpose of the study. To study the satisfaction of the consumer of medical services (patient) for the best understanding of the necessary requirements of the patient for the process of medical care.

The objectives of the study. Conduct a survey of patients according to basic needs and rank them depending on the requirements of the patient, draw up technical specifications that ensure the implementation of the identified needs, based on the data obtained, build a Quality House.

Methods

One of the most effective methods in the field of quality planning is the structuring (deployment) (Quality Function Deployment - QFD).

Structuring quality functions is a method of structuring the needs and wishes of the consumer through the deployment of the functions and operations of activities to ensure at each stage of the life cycle of the project the creation of products of such quality that would guarantee an end result that meets consumer expectations.

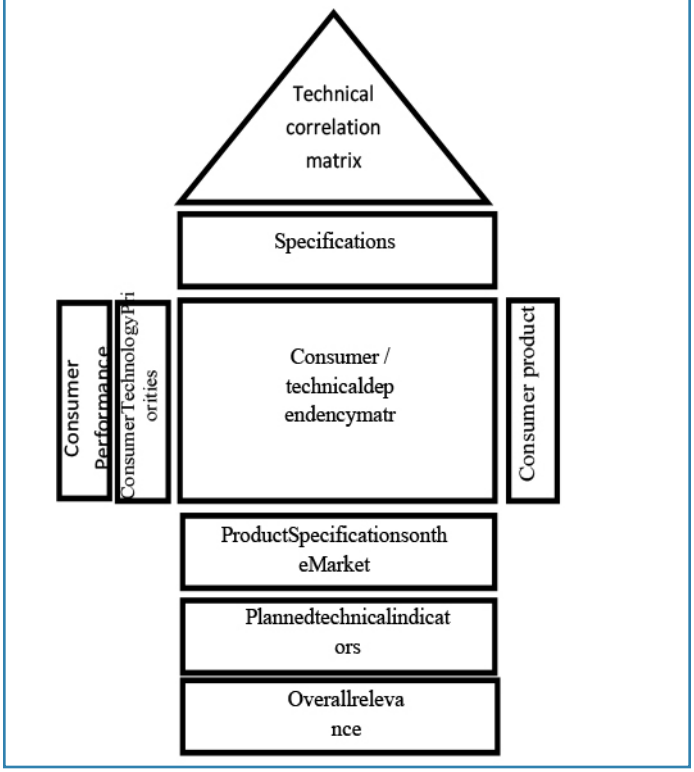
Research method. The method of structuring the quality function is an original Japanese methodology, which aims to guarantee quality from the first stage of creation and development of a new product. The stages of development of the QFD method are associated with the first attempts to apply it in the 50s and 60s of the 20th century - in Japanese shipbuilding industry. In 1961-1966, the most detailed development of the concept of the method took place (YoshiAkao), and in 1969, Matsushita revised this concept. The method was first applied by Toyota and Mitsubishi in 19721,

Specialists described QFD as a method of "manufacturing products for those who use them, and not for those who manufacture them." [3]. American experts in the field of management note that the QFD method has revolutionized quality management, since before that, enterprises concentrated their efforts on meeting technical requirements, sometimes forgetting about customer requests [3].

The main tool of the QFD method is a table called the "Quality House" on Fig.1. It displays the relationship between actual quality indicators (consumer properties) and auxiliary indicators (technical requirements).

SHAPE * MERGEFORMAT

Figure 1. Scheme of "Quality House" [3].



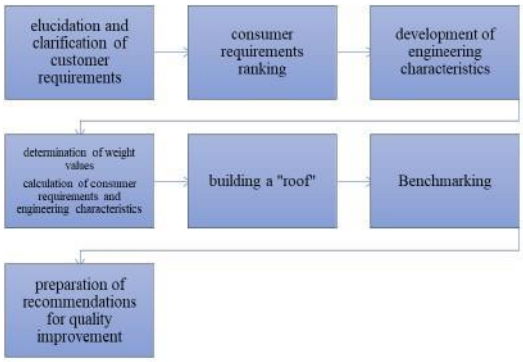
At the heart of building a quality house is a matrix of dependencies of consumer and technical characteristics. It is the determination of the dependencies of technical and consumer characteristics that will determine the important technical characteristics that create the conditions for its provision.

In the course of the study, a survey of primary care patients attending a therapist was conducted. Consumer surveys of medical care services were conducted directly in the medical organization - polyclinic. Composed of more than 450 unique consumer votes. These data formed the basis of the study.

Results

The QFD method was applied in the Health Department of the Kazan Federal Institute. 150 patients were interviewed, each methodology for conducting the QFD method in MSU KFU is presented in Fig. 2.

Figure 2. The methodology of the QFD method in MSU KFU



At the first stage, we collected the wishes of patients to improve the quality of medical services in MSU KFU.

Further, the task was to draw up a rank of importance for each consumer characteristic based on the obtained dependencies of the consumer's voice. To compile the initial matrix obtained by pairwise comparison of the voice of consumersin table 1:

Table 1. Matrix of pairwise comparisons

	Cleanliness	Quickly	Courtesy of the doctors	Convenience	Availability of coupons	Attention	Order	Professionalism	No queues	The ability to accept people without coupons	Kindness	Just-in-time	Interior	Clinic comfort	Awareness	Phone availability	The display does not hang (IS)
Cleanliness	1	9	9	5	9	9	0,2	9	9	9	9	9	0,2	0,1	9	9	9
Quickly	0,1	1	5	0,2	0,1	5	1	9	0,1	0,2	9	0,1	9	5	1	0,2	0,1
Courtesy of the doctors	0,1	0,2	1	9	9	9	9	0,2	9	9	0,1	9	9	9	9	9	9
Convenience	0,2	5	0,1	1	0,2	9	5	9	0,1	0,2	9	0,1	0,2	0,2	0,2	0,2	1
Availability of coupons	0,1	9	0,1	5	1	9	5	9	1	9	9	1	9	9	5	9	9
Attention	0,1	0,2	0,1	0,1	0,1	1	9	1	9	9	0,2	9	9	9	9	9	9
Order	5	1	0,1	0,2	0,2	0,1	1	9	0,2	0,2	9	0,1	9	9	0,2	0,2	0,2
Professionalism	0,1	0,1	5	0,1	0,1	1	0,1	1	0,1	0,2	0,2	0,1	9	9	0,2	0,2	1
No queues	0,1	9	0,1	9	1	0,1	5	9	1	0,1	5	0,1	9	9	1	9	0,2
The ability to accept people without coupons	0,1	5	0,1	5	0,1	0,1	5	5	9	1	0,2	0,2	9	9	0,2	5	0,2
Kindness	0,1	0,1	9	0,1	0,1	5	0,1	5	0,2	5	1	9	9	9	1	9	9
Just-in-time	0,1	9	0,1	9	1	0,1	9	9	9	5	0,1	1	9	9	0,2	0,2	0,1
Interior	5	0,1	0,1	5	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	1	0,2	9	9	9
Clinic comfort	9	0,2	0,1	5	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	5	1	9	0,2	1
Awareness	0,1	1	0,1	5	0,2	0,1	5	5	1	5	1	5	0,1	0,1	1	0,1	0,1
Phone availability	0,1	5	0,1	5	0,1	0,1	5	5	0,1	0,2	0,1	5	0,1	5	9	1	9
The display does not hang (IS)	0,1	9	0,1	1	0,1	0,1	5	1	5	5	0,1	9	0,1	1	9	0,1	1
Dij	21,4	63,9	30,2	64,7	22,5	48,9	64,6	86,4	54	58,3	53,2	57,9	96,7	93,6	73	70,4	67,9

Having received the correlation data of the consumer's voice, we normalize the obtained columns of quantitative estimates, Fij:

Table 2. Normalized Quantitative Data

	Cleanliness	Quickly	Courtesy of the doctors	Convenience	Availability of coupons	Attention	Order	Professionalism	No queues	The ability to accept people without coupons	Kindness	Just-in-time	Interior	Clinic comfort	Awareness	Phone availability	The display does not hang (IS)
Cleanliness	0,047	0,141	0,298	0,077	0,400	0,184	0,003	0,104	0,167	0,154	0,169	0,155	0,002	0,001	0,123	0,128	0,133
Quickly	0,005	0,016	0,166	0,003	0,004	0,102	0,015	0,104	0,002	0,003	0,169	0,002	0,093	0,053	0,014	0,003	0,001
Courtesy of the doctors	0,005	0,003	0,033	0,139	0,400	0,184	0,139	0,002	0,167	0,154	0,002	0,155	0,093	0,096	0,123	0,128	0,133
Convenience	0,009	0,078	0,003	0,015	0,009	0,184	0,077	0,104	0,002	0,003	0,169	0,002	0,002	0,002	0,003	0,003	0,015
Availability of coupons	0,005	0,141	0,003	0,077	0,044	0,184	0,077	0,104	0,019	0,154	0,169	0,017	0,093	0,096	0,068	0,128	0,133
Attention	0,005	0,003	0,003	0,002	0,004	0,020	0,139	0,012	0,167	0,154	0,004	0,155	0,093	0,096	0,123	0,128	0,133
Order	0,234	0,016	0,003	0,003	0,009	0,002	0,015	0,104	0,004	0,003	0,169	0,002	0,093	0,096	0,003	0,003	0,003
Professionalism	0,005	0,002	0,166	0,002	0,004	0,020	0,002	0,012	0,002	0,003	0,004	0,002	0,093	0,096	0,003	0,003	0,015
No queues	0,005	0,141	0,003	0,139	0,044	0,002	0,077	0,104	0,019	0,002	0,094	0,002	0,093	0,096	0,014	0,128	0,003
The ability to accept people without coupons	0,005	0,078	0,003	0,077	0,004	0,002	0,077	0,058	0,167	0,017	0,004	0,003	0,093	0,096	0,003	0,071	0,003
Kindness	0,005	0,002	0,298	0,002	0,004	0,102	0,002	0,058	0,004	0,086	0,019	0,155	0,093	0,096	0,014	0,128	0,133
Just-in-time	0,005	0,141	0,003	0,139	0,044	0,002	0,139	0,104	0,167	0,086	0,002	0,017	0,093	0,096	0,003	0,003	0,001
Interior	0,234	0,002	0,003	0,077	0,004	0,002	0,002	0,001	0,002	0,002	0,002	0,002	0,010	0,002	0,123	0,128	0,133
Clinic comfort	0,421	0,003	0,003	0,077	0,004	0,002	0,002	0,001	0,002	0,002	0,002	0,002	0,052	0,011	0,123	0,003	0,015
Awareness	0,005	0,016	0,003	0,077	0,009	0,002	0,077	0,058	0,019	0,086	0,019	0,086	0,001	0,001	0,014	0,001	0,001
Phone availability	0,005	0,078	0,003	0,077	0,004	0,002	0,077	0,058	0,002	0,003	0,002	0,086	0,001	0,053	0,123	0,014	0,133
The display does not hang (IS)	0,005	0,141	0,003	0,015	0,004	0,002	0,077	0,012	0,093	0,086	0,002	0,155	0,001	0,011	0,123	0,001	0,015

We calculate the sum of each of the obtained rows of normalized quantitative estimates, thus obtaining the weight of each consumer vote in table 3.

Table 3. Consumer votes weight

Consumer characteristic	Rank
Cleanliness	0,892872
Quickly	1,237483
Courtesy of the doctors	0,75134
Convenience	1,318032
Availability of coupons	0,627835
Attention	0,740706
Order	0,954421
Professionalism	1,133323
No queues	1,124613
The ability to accept people without coupons	1,051175
Kindness	1,147711
All in time	1,378685
Interior	0,778519
Clinic comfort	0,988148
Awareness	1,014578
Phone availability	0,930107
The display does not hang (MI)	0,930451

The next step is to compile the desired priority requirements column P in table 4.

Table 4. Consumer votes priority

Consumer characteristic	Pij	Percentage Rank
Just in time	1,38	8%
Convenience	1,32	8%
Quickly	1,24	7%
Kindness	1,15	7%
Professionalism	1,13	7%
No queues	1,12	7%
The ability to accept people without coupons	1,05	6%
Awareness	1,01	6%
Clinic comfort	0,99	6%
Order	0,95	6%
The display does not hang (MI)	0,93	5%
Phone availability	0,93	5%
Purity	0,89	5%
Interior	0,78	5%
Courtesy of the doctors	0,75	4%
Attention	0,74	4%
Availability of coupons	0,63	4%

At the second stage, we ranked the consumer requirements of patients by degree of importance.

At the third stage, a list of engineering characteristics of medical services was compiled - a look at the product from the point of view of the organizer of medical services.

Stage 4 - determination of weight values of engineering characteristics taking into account the rating of consumer requirements, as well as the relationship between consumer requirements and engineering characteristics.

Multiplying the relative weight of consumer requirements (rating) by a numerical indicator of the relationship between consumer requirements and engineering characteristics, determined at the fourth stage, we obtain the relative importance of each engineering characteristic. Summing up the results over the entire graph of the corresponding engineering characteristics, we obtain the value of the goal. The engineering characteristic with the highest goal value should focus on.

The desired column of priorities of the requirements of consumers Pi is obtained from the sums of the corresponding rows by normalizing them, that is:

Table 5. Engineering specifications

Engineering specifications	Pij	Percentage Rank
Regulated work	1,746	10%
Fast service	1,708	10%
Patient Interest	1,622	9%
Individual approach	1,325	8%
Comfortable rooms	1,167	7%
Record for any day	1,163	7%
Staff qualifications	1,036	6%
Available Contact Phones	0,981	6%
Internet / network of a medical organization	0,932	5%
San. Room processing	0,898	5%
Reception without a coupon (special time)	0,874	5%
Availability of coupons for the next 1-2 days	0,862	5%
Interior facilities	0,853	5%
Start / end on time	0,74	4%
Good-natured service (smile)	0,512	3%
Information stand	0,418	2%
Internet / network of a medical organization	0,932	5%

Next, a correlation analysis of patient requirements and technical characteristics was carried out. As a result of the previous steps, a ranked list of consumer requirements was compiled in the language of the consumer, and engineering characteristics formulated in the language of the organizers. For successful product development, consumer requirements must be translated into engineering specifications.

The next step is to determine the answer to the question: how does a given consumer demand depend on what value will be assigned to the characteristic? At this stage, not too accurate, detailed information is required. Enough such vague concepts as “strong connection” (9), “medium connection” (5), “weak connection” (1) and lack of connection (0). Below is a table of symbols in table 6:

Table 6. Communication Conventions

Interval Rating Category	Designation	Accepted value
		correlation coefficient
Strong correlation		9
Power Correlation		5
Weak correlation		1
Lack of correlation		0

The table 7 below shows the correlation of technical and consumer characteristics:

Table 7. Correlation of technical and consumer characteristics

Qualities Translated from Consumer Voice / Specifications	Rank	San. Room processing	Fast service	Individual approach	Comfortable rooms	Record for any day	Patient Interest	Regulated work	Staff qualifications	Start / end on time	Reception without a coupon (special time)	Good-natured service (smile)	Availability of coupons for the next 1-2 days	Interior facilities	Patient Parking	Information stand	Available Contact Phones	Internet / network of a medical organization
Just in time	8%	1	9	5	0	9	5	5	5	5	0	0	9	0	0	0	5	1
Convenience	8%	1	5	1	9	5	0	1	0	1	5	0	1	9	5	9	9	9
Quickly	7%	0	9	5	0	9	5	9	1	9	5	0	1	0	1	0	9	0
Kindness	7%	0	0	9	0	0	1	0	0	0	0	9	0	0	0	0	0	0
Professionalism	7%	0	9	0	0	1	9	5	5	1	1	5	1	0	1	0	1	1
No queues	7%	0	9	1	0	9	5	5	1	0	1	0	9	0	0	0	0	0
The ability to accept people without coupons	6%	0	1	0	0	5	1	1	1	1	9	0	0	0	0	0	0	0
Awareness	6%	0	1	5	1	1	9	1	1	1	1	0	5	0	0	9	9	9
Clinic comfort	6%	5	0	1	9	5	1	0	0	0	0	1	1	9	9	9	9	9
Order	6%	9	9	0	5	0	0	9	1	1	1	0	0	5	0	1	1	0
The display does not hang (MI)	5%	0	9	0	1	1	1	1	1	9	0	0	1	0	0	1	0	1
Phone availability	5%	0	1	0	0	1	1	0	0	0	0	1	1	1	0	0	9	9
Purity	5%	9	0	0	9	0	1	0	0	0	0	0	0	9	0	0	0	0
Interior	5%	5	0	0	9	0	1	0	0	0	0	0	1	9	0	1	0	0
Courtesy of the doctors	4%	0	1	9	0	0	9	1	9	0	0	9	0	0	0	0	0	0
Attention	4%	0	1	9	0	0	5	0	5	1	0	9	1	0	9	0	5	5
Availability of coupons	4%	0	5	1	0	5	1	5	0	5	0	0	9	0	0	0	0	0
Absolutevalue		30	69	46	43	51	55	43	30	34	23	34	40	42	25	30	57	44
Relativevalue		4%	10%	7%	6%	7%	8%	6%	4%	5%	3%	5%	6%	6%	4%	4%	8%	6%

Next, you need to decide whether to leave in the designed product those engineering characteristics that are not needed by the consumer. Therefore, a number of product characteristics that are not of value to the consumer, but which are important for its functioning, must be left behind.

The fifth stage is the construction of the “roof”. Engineering specifications can be multidirectional, which means they can contradict each other.

These characteristics determine in what way, under which conditions, in which modes, the production process should be conducted in order to ultimately obtain products that maximally meet consumer requirements.

The “roof of a quality house” is a correlation matrix filled with symbols that indicate a positive or negative relationship between the relevant technical characteristics of the product from the standpoint of consumer interests shown in table 8. Using the correlation matrix, you can clearly demonstrate the relationship between the main indicators of quality, cost and time.

Table 8. Quality House Roof

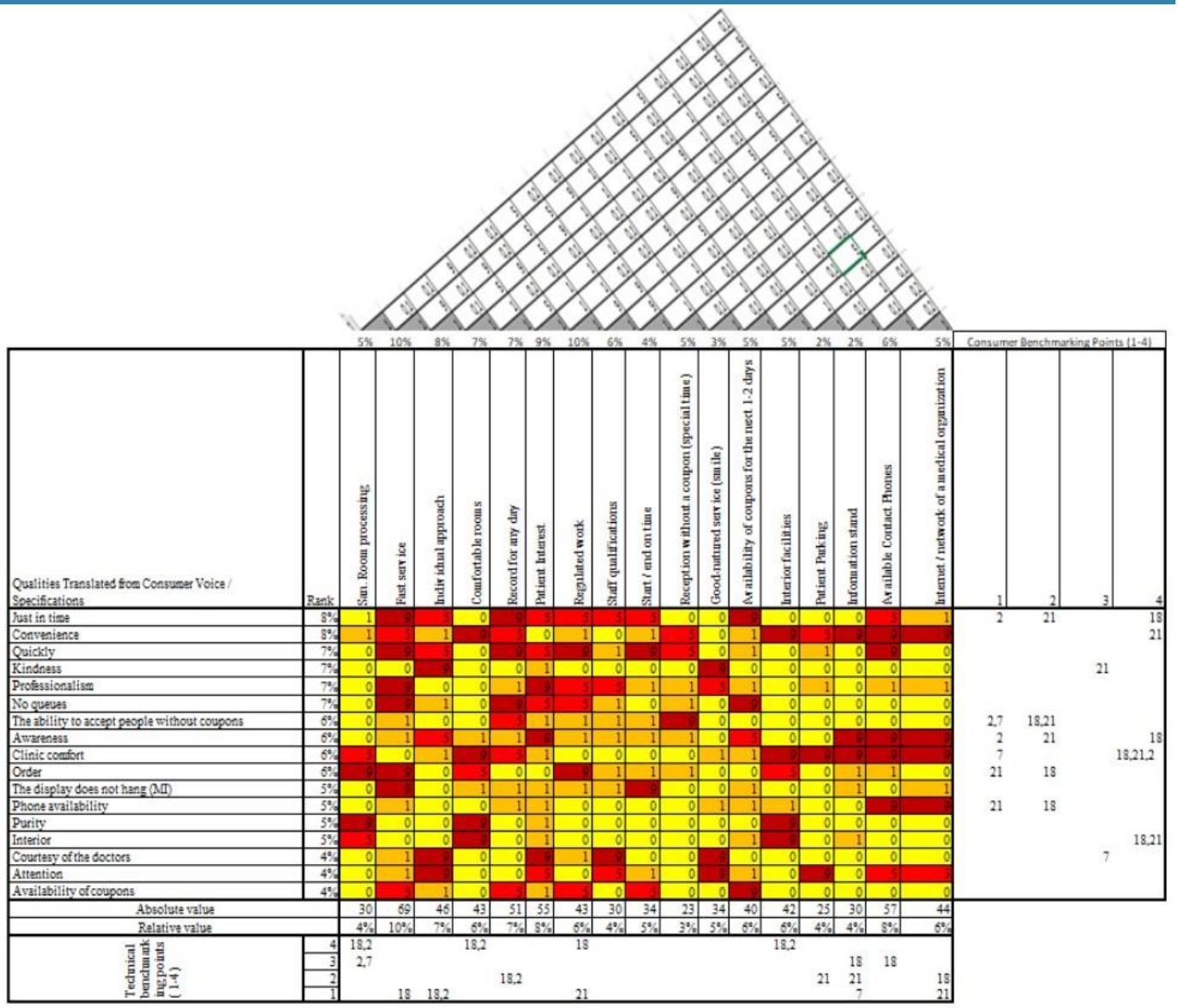
	San. Room processing	Fast service	Individual approach	Comfortable rooms	Record for any day	Patient Interest	Regulated work	Staff qualifications	Start / end on time	Reception without a coupon (special time)	Good-natured service (smile)	Availability of coupons for the next 1-2 days	Interior facilities	Patient Parking	Information stand	Available Contact Phones	Internet / network of a medical organization
San. Room processing	1	0,1	0,1	9	0,1	0,1	5	0,2	0,1	0,1	0,1	0,1	5	0,1	0,1	0,1	0,1
Fast service	0,1	1	9	0,1	9	0,2	5	5	9	1	0,1	5	0,1	1	0,1	5	9
Individual approach	0,1	9	1	0,1	5	9	5	9	1	1	1	1	0,1	1	0,1	0,1	5
Comfortable rooms	9	0,1	0,1	1	1	0,2	0,1	0,1	0,1	0,1	0,1	0,1	9	1	0,1	0,1	0,1
Record for any day	0,1	9	5	1	1	5	1	1	1	0,1	0,1	9	0,1	0,1	0,1	5	5
Patient Interest	0,1	0,2	9	0,2	5	1	1	1	0,1	0,1	9	0,1	0,1	0,1	5	5	1
Regulated work	5	5	5	0,1	1	1	1	9	9	1	0,1	5	0,1	1	5	1	0,2
Staff qualifications	0,2	5	9	0,1	1	1	9	1	9	1	1	0,1	0,1	0,1	0,1	1	1
Start / end on time	0,1	9	1	0,1	1	0,1	9	9	1	1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Reception without a coupon (special time)	0,1	1	1	0,1	0,1	0,1	1	1	1	1	0,1	1	0,1	0,1	1	5	5
Good-natured service (smile)	0,1	0,1	1	0,1	0,1	9	0,1	1	0,1	0,1	1	0,1	0,1	1	0,1	0,1	0,1
Availability of coupons for the next 1-2 days	0,1	5	1	0,1	9	0,1	5	0,1	0,1	1	0,1	1	0,1	0,1	0,1	5	5
Interior facilities	5	0,1	0,1	9	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	1	1	0,1	0,1	0,1
Patient Parking	0,1	1	1	1	0,1	0,1	1	0,1	0,1	0,1	1	0,1	1	1	0,1	1	0,1
Information stand	0,1	0,1	0,1	0,1	0,1	5	5	0,1	0,1	1	0,1	0,1	0,1	0,1	1	0,1	0,2
Available Contact Phones	0,1	5	0,1	0,1	5	5	1	1	0,1	5	0,1	5	0,1	1	0,1	1	0,2
Internet / network of a medical organization	0,1	9	5	0,1	5	1	0,2	1	0,1	5	0,1	5	0,1	0,1	0,2	0,2	1
Amount	21,4	59,7	48,5	22,3	43,6	38	49,5	39,7	32	18,7	14,2	32,9	17,3	8,9	13,4	29,9	33,2

As a result of the above procedures, the initial data for the technical specifications for the design and development of new products were obtained. Building a matrix, obtaining engineering characteristics - this is only the first of the four phases of the “deployment” of consumer requirements, not only in engineering characteristics, but also in the performance of the process and the entire production.

The final, sixth, stage of building the matrix of the House of Quality is its right wall and basement - benchmarking, conducting comparative characteristics of the quality of the provision of medical services with medical organizations - competitors. The analysis is presented in a comparison of existing consumer and technical characteristics at levels from 1 to 4, where 4 is the highest rating. In our study, a comparison was made with the segment of budget clinics and the data are reflected in accordance with the number of the medical organization.

By systematizing all the data obtained during the study, we compile the full matrix of the House of Quality in figure 3:

Figure 3. House of Quality of polyclinic's patient



Qualities Translated from Consumer Voice / Specifications	Rank		San. Room processing	Fast service	Individual approach	Comfortable rooms	Record for any day	Patient Interest	Regulated work	Staff qualifications	Start / end on time	Reception without a coupon (special time)	Good-natured service (smile)	Availability of coupons for the next 1-2 days	Interior facilities	Patient Parking	Information stand	Available Contact Phones	Internet / network of a medical organization	Consumer Benchmarking Points (1-4) 1	2	3	4
			5%	10%	8%	7%	7%	9%	10%	6%	4%	5%	3%	5%	5%	2%	2%	6%	5%				
Just in time	8%		1	9	5	0	9	5	5	5	5	0	0	9	0	0	0	5	1	2	21		18
Convenience	8%		1	5	1	9	5	0	1	0	1	5	0	1	9	5	9	9	5				21
Quickly	7%		0	9	5	0	9	5	9	1	9	5	0	1	0	1	0	9	0				
Kindness	7%		0	0	9	0	0	1	0	0	0	0	9	0	0	0	0	0	0			21	
Professionalism	7%		0	9	0	0	1	9	5	5	1	1	5	1	0	1	0	1	1				
No queues	7%		0	9	1	0	9	5	5	1	0	1	0	9	0	0	0	0	0				
The ability to accept people without coupons	6%		0	1	0	0	5	1	1	1	1	9	0	0	0	0	0	0	0	2,7	18,21		
Awareness	6%		0	1	5	1	1	9	1	1	1	1	0	5	0	0	9	9	9	2	21		18
Clinic comfort	6%		5	0	1	9	5	1	0	0	0	0	1	1	9	9	9	9	9	7			18,21,2
Order	6%		9	9	0	5	0	0	9	1	1	1	0	0	5	0	1	1	0	21	18		
The display does not hang (MI)	5%		0	9	0	1	1	1	1	1	9	0	0	1	0	0	1	0	1				
Phone availability	5%		0	1	0	0	1	1	0	0	0	0	1	1	1	0	0	9	9	21	18		
Purity	5%		9	0	0	9	0	1	0	0	0	0	0	0	9	0	0	0	0				
Interior	5%		5	0	0	9	0	1	0	0	0	0	0	1	9	0	1	0	0				18,21
Courtesy of the doctors	4%		0	1	9	0	0	9	1	9	0	0	9	0	0	0	0	0	0			7	
Attention	4%		0	1	9	0	0	9	0	5	1	0	9	1	0	9	0	5	5				
Availability of coupons	4%		0	5	1	0	5	1	5	0	5	0	0	9	0	0	0	0	0				
Absolute value			30	69	46	43	51	55	43	30	34	23	34	40	42	25	30	57	44				
Relative value			4%	10%	7%	6%	7%	8%	6%	4%	5%	3%	5%	6%	6%	4%	4%	8%	6%				
Technical benchmarking points (1-4)		4	18,2			18,2			18						18,2								
		3	2,7														18	18					
		2					18,2									21	21		18				
		1		18	18,2				21								7		21				

In general, the method allows not only to formalize the procedure for determining the main characteristics of the developed product taking into account the wishes of the consumer, but also to make informed decisions on the quality management of the processes of its creation.

Thus, by "deploying" quality at the initial stages of the product life cycle in accordance with the needs and wishes of the consumer, it is possible to avoid adjusting the product parameters after it appears on the market (or at least minimize it) and, therefore, ensure high value and at the same time a relatively low cost of the product (by minimizing non-manufacturing costs).

The data obtained can be grouped according to the four most important characteristics necessary for patients:

- lack of expectation;

- comfortable conditions;

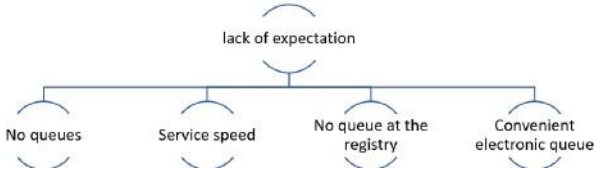
- polite doctors;

- the information system does not hang.

The most important components of each of the patient's requirements are presented in tables3-5.

So, the patient's requirement "No waiting" is expressed in the absence of queues, speed of service, the absence of a queue in the registry, a convenient electronic queue.

Figure 4. Most repetitive components of the "No waiting" requirement



In mapping the flow of value creation and monitoring patients at the doctor's office, the following reasons for expectations were noted:

- the occurrence of the queue due to incorrect scanning of the barcode;
- incorrect operation of the scoreboard;
- freezing of the information system.

The second reason for the expectation is the expectation of admission, two reasons are defined here:

- reception is delayed by the doctor (there is no nurse to write out directions, the doctor detains the previous patient, patients come without coupons, emergency patients, the system freezes);
- reception is delayed due to the patient (the patient does not correctly scan the ticket, not following the reception order).

Discussion

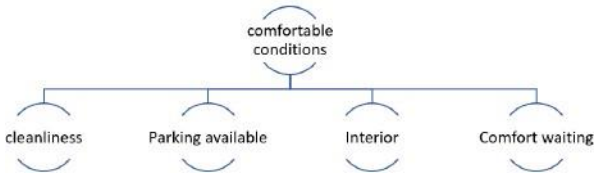
Discussion on the results of the study. Recommendations for improving the provision of medical services in the component "Lack of expectation":

Table 9. Measures to improve the quality of medical services in the component "Lack of expectation"

№	Component requirements	Quality Improvement Activities
1	No queues	Information on the technique of correct scanning of coupons
2	Service speed	Finalization of the IIA on the work of the scoreboard
3	No queue at the registry	Improving MIS on system performance
4	Convenient electronic queue	Informing patients about clear e-queue technology

So, the patients requirement "Comfortable conditions" is expressed in cleanliness, comfortable interior, comfort of waiting areas and the presence of parking.

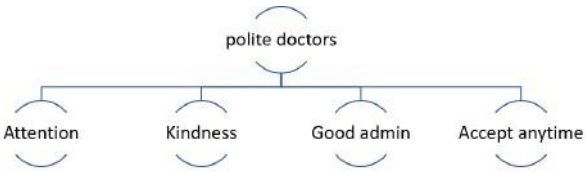
Figure 5. Most repetitive components of the "Comfort Conditions" requirement



These technical requirements are fully implemented in MSU KFU.

The requirement of patients "Polite doctors" contains such indicators as attention, kindness, the ability to receive at any time and a good administrator.

Figure 6. Most repetitive components of the Polite Doctors requirement



These indicators indicate that the empathy of the doctor also plays a fairly significant role as well as professionalism.

A survey of the entire staff of MSU KFU for the assessment of the level of empathic abilities is proposed. An empathy test by V. Boyko was chosen as the recommended technique, which reveals three channels of empathy [4].

The rational channel of empathy characterizes the direction of attention, perception and thinking of an empathizing person on the essence of any other person - on his condition, problems, behavior. This is a spontaneous interest in another, opening the gateways of emotional and intuitive reflection of the partner. In the rational component of empathy should not be looked for emotional channel of empathy. The ability of an empathizing person to enter into one emotional "wave" with others is fixed - to empathize, to participate. Emotional responsiveness in this case becomes a means of "entering" the partner's energy field. To embrace his inner world, to predict behavior and to act effectively is possible only in the event that there has been an emotional adjustment to the empathized. Compassion and empathy act as a connecting link, a conductor from empathizing to empathizing and vice versa.

An intuitive channel of empathy. A score indicates the ability of a person to see the behavior of partners, to act in conditions of a lack of objective information about them, based on experience stored in the subconscious. At the level of intuition, various information about partners is formed. Intuition is less dependent on stereotypes than a meaningful understanding of partners [4].

The "good administrator" component is achieved through the implementation of the cascade system of interaction with the patient "10 seconds".

A cascading system of interaction with a patient in a medical organization involves 2 levels. In the event of unusual situations, it is permissible to increase interactions with patients to the third level. The number of levels is not limited, however, an increase in their number is an undesirable deviation and is subject to elementation.

The first level is the first contact of the patient with the hall manager in the hall of the 1st floor of the medical organization. The main consumer of the first stage is a patient who first came to a medical organization and who does not have experience in achieving the required competence of medical staff. The first contact is aimed at quick sorting of patients, and should last no more than 10 seconds. During this time, the hall manager routes the patient, depending on his condition, to standard directions. Maintaining the time parameter of the first contact in 10 seconds imposes stringent requirements on the competencies of the hall manager. The criteria for the effectiveness of the first contact are: completeness of answers to the patient's questions, contact time of no more than 10 seconds, achievement by the patient of the required competence on the part of the medical institution, correct friendly communication. If the patient is forced to ask additional questions to the representatives of the medical organization on the way to reaching the 2nd station of the cascade "10 seconds", the interaction of the 1st stage is ineffective.

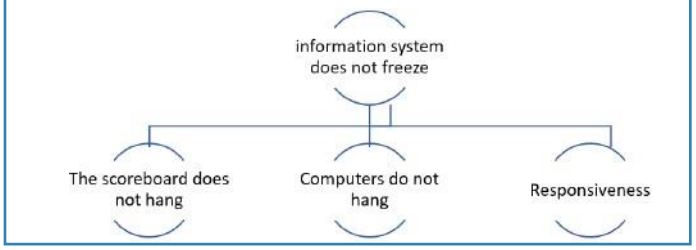
The second contact with the patient occurs in the information and contact center of the outpatient department of the medical organization specially organized for these purposes and also lasts no more than 10 seconds. Here, the preparation of the patient's entry into the process is carried out by means of an inquiring survey about the patient's condition and the correctness of its routing, fixing the patient's condition with the help of an independent questionnaire, explaining the rules for using the electronic queue, arranging a meeting with the doctor.

The criteria for the effectiveness of the second station of the cascade are: placement of the patient in the lobby to wait for his turn, preparation for the process of providing medical care, correct friendly communication. Important at this stage may be the diagnosis of the patient's mental state and, if necessary, calling a psychologist in the waiting room.

The third contact occurs with non-standard requirements of the patient and is 2.5 minutes. The occurrence of this situation is possible with insufficient competence of the employees of the 1st and 2nd stations of the cascade, as well as with the non-standard needs of the patient, requiring in-depth study, followed by the provision of a standard response protocol for the personnel of the medical organization, which is the development of the "10 seconds" system. Contact with the patient is carried out by the management of the corresponding department. The criteria for the effectiveness of the third contact are: the ability to meet the needs of the patient, the contact time in the acceptable range of 2.5 minutes, the organization of the provision of medical care according to the scheme - CITO, the correct friendly communication.

The requirement "The information system does not hang" assumes that the information board does not hang, the computers in the doctor's office at the reception do not hang, the IIA is responsive.

Figure 7. The most repeated components of the requirement "Information system does not hang"



Summary

Consideration of patient satisfaction with the quality of the medical service provided through the use of QFD analysis allows you to systematize the data received from the consumer and hear not only specifically formalized requests, but also "hear" between the lines what is most important to the consumer in the process of receiving medical services. The method of structuring the quality functions helps to involve medical personnel in the formation of a quality service that is in demand in the consumer market - to improve an existing one or create a new one. In the course of the study, it was possible to identify ways to improve the existing service, so for the factor - lack of expectation, an additional analysis was conducted in the format of mapping the flow of The development of the factor "comfortable conditions" is associated with providing a comfortable infrastructure of the premises of the medical organization and with the factor "polite doctors", as a result of the deployment of which the "10 seconds" method was implemented - the first contact method by the patient, as a result of which the interaction and the routing speed of the patient are improved. Based on the information system freezing criterion, a decision was made to collect complaints from medical personnel, patients and finalization of problematic issues with the developers of the information system.

Conclusions

Summarizing the above data, we conclude that the methodology of structuring quality functions (QFD analysis) for a medical organization is a method of systematizing consumer complaints and examining their basic needs that patients expect to meet by coming to the clinic by receiving quality medical care, and the quality criteria in in turn, they are developed by a team of experts (medical workers), which gives the maximum effect of the interaction of the patient and medical personal. The application of this technique can be tested at all stages of the life cycle and implemented through a system of continuous improvements. Conducting a continuous analysis of consumer desires is the basis for building a flexible change management system and adjusting the system to the needs of patients, especially in the process of transition of a medical organization to new working conditions or a state of uncertainty in health systems in a pandemic.

Acknowledgements

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