

Evaluation and Analysis of the Impact of Customer Satisfaction of After-sales Service of Medical Equipment on Financial Performance-Taking a Medical Equipment Company as an Example

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Abstract

The medical equipment industry is very professional. With the rapid development of science and technology, especially the research on human health and medical treatment, it cannot be ignored. Under the large-scale impact of the Covid-19 epidemic in recent years, people have learned that the current medicine is still very important. There are many deficiencies, which will further promote the development of the medical industry. Taiwan's import of high-end medical equipment industry is very rapid, which represents the importance that various institutions attach to medical quality, so it is reflected in the consumer demand market. This market competition for updated equipment is like an arms race. In order to improve performance, medical equipment manufacturers must not only constantly introduce new equipment and products, but also know how to manage professional medical customers and pay attention to customer feelings and sales satisfaction. This research aims at medical professional customers' satisfaction with the after-sales service customer service of medical equipment companies, adopts the research questionnaire survey method, uses paper questionnaires and online questionnaires to investigate demographic variables, satisfaction, and emphasis, and uses correlation analysis to detect satisfaction degree and financial performance, and use descriptive statistical analysis and regression analysis to test the correlation and influence of demographic variables and satisfaction. Projects, focusing on the variable groups with greater influence, make internal adjustments and service upgrades to improve the overall after-sales service satisfaction, thereby driving the growth of the company's performance and performance. ◦

According to the research results, the service items valued by the customer group are the most

important in practical reliability, certainty and immediacy, and the statistical orientation can be clearly influenced by the five dimensions in the service quality conceptualization model (PZB, 1988): 1. Reliability 2. Responsiveness 3. Assurance 4. Empathy 5. Tangible, so medical equipment manufacturers should continue to maintain good technical service quality to improve customer satisfaction and loyalty. It also improves the willingness of first choice for the next purchase. These results can be used as a reference for improving the company's internal core value and planning marketing strategies.

Keywords:

Medical equipment, Service quality conceptualization model, After-sales service customer satisfaction

Biographical notes:

The author of this article is a Ph.D. student in Feng Chia university, Taiwan and has been engaged in biomedical services in listed company CHC for more than 20 years. He is very experienced in the operation and performance management of the medical equipment service industry and is a very professional manager. Currently studying at Feng Chia University for a Ph.D. program in business. His main research areas are issues related to corporate performance management and research and development.

1. Introduction

The competition in Taiwan's medical market is very fierce. Under the environment of the free trade market, the implementation of the national health insurance bill, such a policy that benefits the people, not only increases the momentum for medical institutions to purchase new equipment and medical materials, but also makes medical quality and standard have been greatly improved, and the number of medical equipment and pharmaceutical companies has also increased very quickly and in large numbers. However, due to Taiwan's small population and geographical constraints, there will still be an upper limit to the development of the market. Under such conditions, there will be fierce competition in market prices, and the profits of medical companies will be compressed. Under the influence of such fierce market competition, in recent years, customer service has been paid more and more attention. In addition to the improvement of customer satisfaction, the innovation of service models has further required service quality. However, in the professional medical service industry, more attention is paid to service. quality

and customer satisfaction. Because whoever can provide the most complete customer service can capture the hearts of customers and gain market share in the highly competitive market. This also shows that customer relationship management (Customer Relationship Management, Gartner Group, 1999) is absolutely a medical subject that equipment companies attach great importance to.

The value of customer service window tracking and customer satisfaction is born in response to this trend. It acts as the most important external contact of the enterprise. How to improve customer satisfaction and increase the value of products, but what cannot be ignored is the maintenance of customer service personnel in each. It plays an important role in the delivery process of the equipment service.

Therefore, whether it is marketing or customer relationship management, the concept of customization has already penetrated into the industry, especially in the medical equipment industry with high professionalism and low replaceable. What operators pay attention to is not only in the stage of medical product introduction, but also how to attract medical customers. In addition to focusing on the eyes of the group, customers' repurchase behavior must also be considered; the purpose of customized services is to improve customer service levels through continuous improvement, increase customer satisfaction, and retain customers and repurchase intentions. In order to win the recognition of customers, enterprises must start with long-term customer relationship management and improve "service value". This is the most effective way for enterprises to improve performance and expand market share. With reference to domestic and foreign literature, the structure of this research is completed, and it is assumed that the satisfaction of "service commitment", "word-of-mouth", "professional experience" and "service efficiency" generated by consumers of the medical customer group on the service will affect "sales performance", and then affect its "loyalty". It is hoped that the research on the correlation between customer satisfaction and performance can provide a reference for the future development of the medical materials and equipment industry. Taiwan's medical industry ecology is very different from Europe and the United States. Whether it is long service hours or high equipment operation and proper rate, it is a very important indicator of medical service competition, so the medical industry itself is like a service industry, and industry operators who cooperate with this medical service ecology must propose a product sales and service model that can satisfy consumers and are willing to pay. In addition to purchasing enough peripheral equipment, they must provide all-weather warranty and multi-year warranty, and even the construction and maintenance of related construction projects, including the most popular AI smart monitoring, etc., high value-added software and hardware products and services can win the favor of large medical

institutions.

This paper studies the customer satisfaction of after-sales service and shows whether customer relationship, service quality, and cognitive value have a positive impact on customer loyalty and customer satisfaction . In addition, cognitive value will positively affect customer loyalty and customer satisfaction, customer satisfaction will positively affect customer loyalty, and customer satisfaction will positively affect corporate financial performance and performance. °

2. Background and research questions

2.1 Research Background

2.1.1 Taiwan Medical Equipment Industry

Taiwan's medical equipment industry is mainly divided into three levels, from the supply of upstream parts and materials, including IC electronic components, textile fabrics and biomaterials, to the midstream medical equipment manufacturing, including medical testing, medical auxiliary Tools, optical instruments, special dressing consumables to high-end medical equipment. The downstream industry is a professional agent and distributor of medical equipment and consumables, which is closely related to the functional attributes of the product. The main sales channels are hospitals, clinics and other medical institutions, as well as pharmacies. The object of this study is mainly the bulk medical equipment agents or manufacturers in Taiwan's medical market.

2.2 Research questions

Looking at the current academic research , there are many related studies on customer satisfaction, but there is no research on the correlation between customer service and actual performance . This research focuses on the performance of a listed medical equipment company in five years. Whether there is a relevant impact and correlation between revenue and its customer satisfaction survey.

The purpose of this study is to conduct a questionnaire survey, focusing on major medical institutions in the north, central and south of Taiwan. In addition to the supervisor or attending physician who has the right to purchase or choose medical treatment as the research object, the technical personnel and nurses who operate medical equipment are also selected. personnel, and even administrative staff in medical institutions were also included in this research, so as to understand which key factors affect customer satisfaction and loyalty, and use various statistical analysis methods to further understand the correlation between variables , containing :

- A. After-sales service customer satisfaction and financial performance and the direction of influence.
- B. The horizontal relationship between demographic variables and after-sales service customer satisfaction.
- C. Analysis of the importance of demographic variables on after-sales service satisfaction.

3. Research Method and Sample Description

3.1 Overview of customer service methods

At present, the methods for enterprises to obtain customer satisfaction surveys are generally divided into the following categories :

- A. Set up a complaint and suggestion system

A customer-centric enterprise should be able to facilitate customers to pass on their suggestions and customer complaints. The establishment of a customer complaint and suggestion system can collect customer opinions and suggestions. For example, medical institutions can set up suggestion boxes in the aisles, provide opinion cards for inpatients, or hire a patient to collect opinions from patients. Some customer-centric enterprises have established a free telephone called "customer line", so as to facilitate customer consultation, suggestion or complaint to the greatest extent. These streams of information help businesses resolve issues more quickly.

- B. Customer Satisfaction Scale Survey :

Don't think that with the establishment of a complaint and suggestion system, you can fully understand customer satisfaction and dissatisfaction. Not all dissatisfied customers will complain. When customers are dissatisfied with poor service, they will have the following reactions: customers will buy elsewhere; they will even tell other customers not to buy from shopping vendors that provide poor service; only a few people will write a letter complaining about poor service or blame the salesperson for poor service. Therefore, enterprises cannot use the degree of complaints to measure customer satisfaction, but should conduct periodic surveys to obtain direct indicators of customer satisfaction.

Enterprises can ask buyers how satisfied they are by phone or letter. In these tests of customer satisfaction, the questionnaire or test scale is generally designed from the following two aspects: one is to list all the factors that may affect customer satisfaction, and then arrange them from the most important to the least important according to the degree of importance, and finally select a few factors that the company cares most, and let the interviewees help judge the importance of these factors; ask the interviewees to evaluate the satisfaction of the important

factors selected to be evaluated, generally with five scales, such as Highly satisfied, generally satisfied, no opinion, somewhat dissatisfied, extremely dissatisfied. This is the main way to discover customer satisfaction and dissatisfaction. The enterprise will use this information to improve its work in the next stage. This research chooses this survey method.

C. Pretend Shopping :

Another effective way to learn about customer satisfaction is to hire people who pose as potential buyers to report on the strengths and weaknesses they find in their purchases of the firm's and competitors' products. These fake shoppers can even make trouble on purpose to see if the company's salespeople can handle things well. Not only should businesses hire fake shoppers, but managers themselves should leave the office from time to time to shop at businesses and competitors and experience for themselves what it's like to be a customer. For managers, there is another unusual method: call your company as a customer to ask questions and complaints, and see how the employees of the company deal with these problems. For example, some insurance companies will call customers and ask their staff if they have persuasive sales to customers, or sign on behalf of customers.

D. Lost customer analysis

Businesses should reach out to customers who stop buying or switch to other suppliers to understand why this happened. When a business loses a customer, it should do its best to explore why the analysis failed: whether the price was too high, the service was faulty, the product was unreliable, and so on. It is very important to conduct "exit research" and control "customer loss rate". Because the customer churn rate rises, it shows that the business is not satisfactory in terms of satisfying customers.

The survey method of customer satisfaction is actually to collect information about customer consumption perception. For this reason, enterprises must design their own processes and systems in detail. Generally speaking, there are two types of channels for obtaining feedback, formal and informal. Formal channels are mainly open and stylized, such as customer complaint systems and customer satisfaction surveys. Informal channels are non-public and hidden feedback. Such as the pretend shopping method, and even arrange eyeliner among customers. The advantage of the formal channel is that it is stylized, but the disadvantage is that it is too slow. In addition, due to factors such as face and emotion, it is inconvenient for customers to express their dissatisfaction. The advantage of informal channels is that they can get the most confidential information from customers quickly. The disadvantage is that they are non-programmed, and there is a tendency to generalize the opinions of individual customers.

Enterprise managers should make good use of these two methods to make up for the lack of formal channels with informal channels.

3.2 Description of research methods

In this study, the data files and codes are carried out for the questionnaire recovery results, and the statistical software used is mainly SPSS, supplemented by EXCEL to carry out statistical analysis of the recovery, and according to the purpose of this research, the following statistical methods are used for data analysis and description :

A. Correlation analysis

Correlation analysis , correlation analysis is to study whether there is a certain dependence relationship between phenomena, and to explore the direction and degree of correlation of specific phenomena with dependence relationship. It is a statistical method to study the correlation relationship between random variables. °

B. Descriptive statistics

In data analysis, the collected data are consolidated, recorded and explained by descriptive statistics, and the distribution, percentage and average of each variable are used to understand the distribution of each data, the purpose is to understand the structure and status of the sample, To illustrate the tendency of scale scores to concentrate or disperse.

Then, the descriptive statistical cross-comparison method is used to analyze the importance of after-sales service of each demographic variable, the purpose is to understand the structure and status of the sample, and to explain the concentration or dispersion trend of the scale scores. Through the statistical analysis of samples, we can understand the distribution of demographic variables of the influence of medical institutions on after-sales service of medical equipment , the statistical situation of medical institutions' satisfaction with after-sales service of medical equipment in 2016-2020, and the impact of demographic variables on after-sales service of various aspects. How to improve the overall medical equipment after-sales service satisfaction.

C. Regression analysis :

In order to understand the degree of correlation between statistical variables in this study, simple linear regression analysis was performed based on valid samples. If the correlation coefficient reaches a significant level, it can be used to indicate the correlation and influence between them, but it cannot fully explain the causal relationship between variables. . This study uses the establishment of a regression equation to test the relationship between demographic

variables and after-sales service customer satisfaction levels, and further explores the impact of medical equipment after-sales service satisfaction on financial performance.

3.3 Instructions for sample selection

In this study, the statistical results of after-sales service satisfaction questionnaires conducted by a medical equipment company to various medical institutions from 2016 to 2020 were used, and the 2017-2021 annual data were extracted according to the public financial report of a medical equipment company. its correlation analysis. The questionnaire survey of this study adopts two survey methods, and the paper survey is used for demographic variables and satisfaction surveys, and incomplete answers and invalid samples are deducted. Nursing staff, technical staff, and administrative staff randomly sample 50 valid samples each year, and use 200 valid samples for analysis each year, a total of 1,000 valid samples. In addition, for the purpose of this research, to explore the impact of customer service satisfaction on performance, an additional 300 online questionnaires were distributed to rank the emphasis on after-sales service for each demographic variable, and to eliminate incomplete answers and invalid samples. Physicians, nurses, technicians, and administrative staff randomly sampled 50 valid samples each for statistical analysis, totaling 200 valid samples. After coding and quantifying all valid sample questionnaires, the statistical data of the sample structure were obtained.

4. Research result

4.1 2017- 2021 Financial report analysis

Based on the purpose of the research, it explores the impact evaluation and analysis of after-sales service satisfaction on financial performance, extracts the public financial report information of the case company from 2017 to 2021, and uses the return on investment and earnings per share of each year as the analysis and comparison . The performance ranking is the best in 2019 , followed by 2020 , 2021 , 2018 , and 2017 in descending order . The detailed financial report reference values are as follows Table 1 .

Table 1 2017-2021 Case Company Financial Details

Project	2017	2018	2019	2020	2021
ROI	-0.89 %	2.82 %	4.04 %	2.96%	2.97%
EPS	\$ 0.62	\$ 2.32	\$ 2.83	\$ 2.53	\$ 2.43

4.2 Statistical Results of Demographic Variables Sample

This study takes medical institutions as the research object, and uses descriptive statistics to

analyze population variables. Descriptive statistics is a method of summarizing and expressing quantitative data in a way that reveals the distribution characteristics of data. Through counting times, we can understand the distribution of each value in the data set. Then, the overall distribution trend and characteristics of the data can be obtained. The demographic variables of the questionnaire survey sample in this study include gender (male, female) , position (managerial, non-managerial) and work location (north, middle part, south) . In this research, we named the workplace area. After sorting out and analyzing the hospital operation of medical equipment in 2016-2020. The basic information of the personnel filling out the questionnaire, and the demographic variable data are presented in the form of percentages. The analysis results show that the proportion of male and female is unevenly distributed. Because most of the nurses and administrative staff are female, this research does not include gender in the follow-up in the impact assessment; the distribution of positions is relatively average; regional statistics show that the proportion in the south is slightly lower, and the number of people in the north and middle part is relatively average. Because the population in the north and middle part is relatively large, the number of medical staff in various medical institutions will increase relatively. Detailed statistical results Such as Table 2.

Table 2 Demographic Variable Sample Statistical Analysis Percentage

Project	Variable	Percentage				
		2016	2017	2018	2019	2020
Gender	Male	37.5%	38.0%	34.5%	36.5%	32.5%
	Female	62.5%	62.0%	65.5%	63.5%	67.5%
Position	Managerial	47.5%	48.5%	52.5%	50.5%	47.5%
	Non-managerial	52.5%	51.5%	47.5%	40.5%	52.5%
Area	North	38.0%	35.0%	36.0%	33.5%	36.0%
	Middle part	34.5%	37.0%	34.5%	37.5%	35.0%
	South	27.5%	28.0%	29.5%	29.0%	29.0%

4.3 2016- 2020 Statistical Results of After-sales Service Customer Satisfaction

The satisfaction survey scale is filled in with the Likert five-point scale, which is divided into five aspects according to the after-sales service of medical equipment. The five aspects are reliability, responsiveness, authenticity, empathy, and tangibility. According to personal feelings and satisfaction levels, select the degree of conformity from five options of "very dissatisfied", "dissatisfied", "normal", "satisfied" and "very satisfied" for different aspects, and give 1, 2, 3, 4 respectively , 5 points to measure the satisfaction of all aspects of after-sales service, the higher the score, the higher the satisfaction, otherwise the lower the score. According to the satisfaction

statistical results of the Likert scale, descriptive statistics are used to obtain the average number of satisfaction with various aspects of a company's after-sales service for different demographic variables over the years. The statistical results show that in terms of customer satisfaction in medical equipment after-sales service from 2016 to 2020 , the average satisfaction rate in 2016 was the lowest in previous years , and customer satisfaction has been continuously improving since 2016 . The averages of satisfaction in 2018 reached the highest level in the five-year observation period, among which the top 3 highest averages of satisfaction in each year were reliability, empathy, and tangibility ; The number is the lowest, and the statistical results are as Table 3 .

Table 3 2016-2020 After-sales service customer satisfaction survey statistical average analysis

Project	2016	2017	2018	2019	2020
Reliability	4.245	4.350	4.790	4.515	4.435
Responsiveness	3.960	4.165	4.630	4.410	4.345
Empathy	4.190	4.340	4.675	4.325	4.430
Assurance	3.645	3.850	4.390	4.035	4.005
Tangible	4.055	4.175	4.645	4.330	4.240

After further investigation of this research case company, in 2017, the technical department of the company made several key adjustments in management, including the establishment of a product line system, the implementation of personnel classification, the increase of original factory training courses and the introduction of ISO quality management system, so as to improve the professional ability of employees Improve the overall work efficiency, so the customer satisfaction of after-sales service in 2018 has increased significantly. According to the comparison of the above statistical results with the 2017-2021 financial report analysis of a medical equipment company, it is confirmed that the customer satisfaction of after-sales service in the previous year does affect the overall financial performance of the next year .

4.4 The relationship between after-sales service customer satisfaction and financial performance and the direction of influence

In order to confirm the relationship and direction of impact between sample statistical data satisfaction and financial performance, correlation analysis is used to detect its correlation. Generally, researchers believe that the correlation coefficient below 0.3 is low correlation, 0.3~0.7 is medium correlation, and above 0.7 is high correlation. Therefore, the correlation coefficient between after-sales service customer satisfaction and financial performance in this research is 0.780 , and the relationship between the two variables can be inferred. are highly correlated. The

analysis results are as Table 4 .

Table 4 2016-2020 After-sales Service Customer Satisfaction and 2017-2021 Financial Performance Correlation Analysis

		Satisfaction	EPS
Satisfaction	Pearson related	1	.780
	Significance (one-tailed)		.060
	N	5	5
EPS	Pearson related	.780	1
	Significance (one-tailed)	.060	
	N	5	5

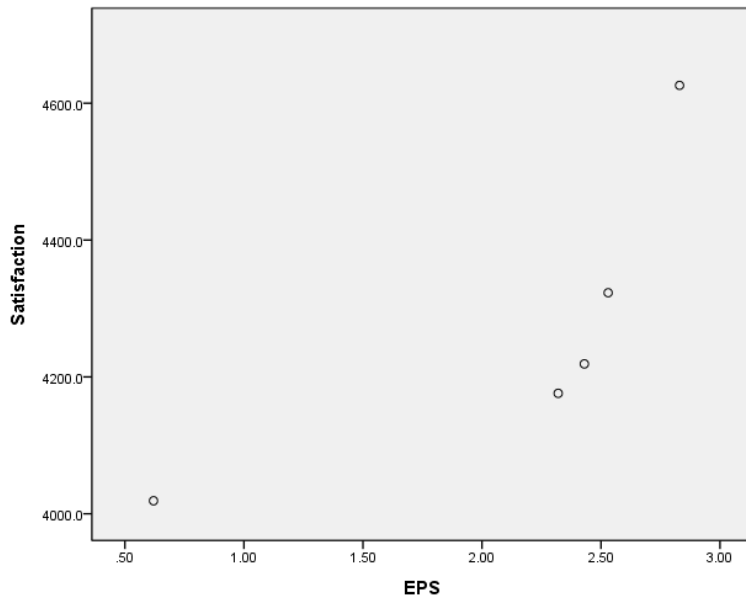
Satisfaction : Customers satisfaction degree.

EPS : Earning per Share.

Note: Correlation coefficient below 0.3 is low correlation, 0.3~0.7 is medium correlation, and above 0.7 is high correlation.

The research sample only collects satisfaction and financial report data for 5 years. Using a significance level test of 0.05, the correlation result of 0.06 is not significant. Therefore, a scatter diagram is used to analyze the direction of influence between the two variables. The results show that after-sales service customers are satisfied Degree and financial performance are positive linear, see Figure 1 for details . There is a positive relationship between the two variables , which proves that after-sales service is closely related to the overall financial performance. °

Figure 1 2016-2020 After-sales service customer satisfaction and financial performance scatter diagram



Satisfaction : Customers satisfaction degree.

EPS : Earning per Share.

Note: Correlation coefficient below 0.3 is low correlation, 0.3~0.7 is medium correlation, and above 0.7 is high correlation.

4.5 The horizontal relationship between demographic variables and after-sales service customer satisfaction

This research uses linear regression analysis to investigate the relationship between demographic variables and customer satisfaction levels in after-sales service. Linear regression analysis (Linear Regression Analysis) is a method used in statistics to explore the linear correlation between two or more variables. The purpose of linear regression analysis is to predict the value of the dependent variable by modeling the relationship between a set of independent variables and a dependent variable. Use linear regression analysis to analyze the collected data to clarify whether the independent variable has a significant impact on the dependent variable . There are 4 items listed as independent variables in the design of this questionnaire survey, including gender, position, job title, area, and the statistical results of questionnaire recovery it shows that the gender ratio is uneven, so it is not included in the reference of significant impact; the dependent variable is divided into five items: reliability, responsiveness, empathy, assurance, and tangible.

Describe the significance of the independent variable. Through the T value and P value, you can test whether the independent variable significantly affects the dependent variable. This study uses the P value significance test. If the P value of the independent variable coefficient is less than 0.05, it is considered that the independent variable has a significant impact on the dependent variable. If the variable has a significant effect, if the P value is greater than 0.05, it is considered that the

independent variable has no significant effect on the dependent variable. According to the analysis results, the job title and area in the independent variables have a significant impact on satisfaction. Therefore, the evaluation of the impact of customer satisfaction on financial performance of medical equipment after-sales service can be based on the job title and importance items of medical equipment after-sales service in each region. The degree of difference is reviewed separately. Detailed statistical results such as Table 5 - Table 9.

Table 5 2016-2020 Population Variables and Satisfaction Significance Analysis Table -
Dependent Variable: Reliability

Dependent variable: Reliability					
Independent variable	2016	2017	2018	2019	2020
(Constant)	.604	.964	.000***	.032	.138
Job title	.627	.991	.377	.090	.014*
Position	.006**	.001**	.137	.065	.000***
Area	.000***	.000***	.081	.000***	.000***

Reliability : The ability to perform the promised service reliably and correctly.

Note : *: p<0.05 ; **: p<0.01 ; ***: p<0.001

Table 6 2016-2020 Population Variables and Satisfaction Significance Analysis Table -
Dependent Variable: Responsiveness

Dependent variable: Responsiveness					
Independent variable	2016	2017	2018	2019	2020
(Constant)	.076	.234	.001**	.292	.236
Job title	.166	.926	.949	.134	.464
Position	.262	.208	.186	.110	.000***
Area	.016	.000***	.001**	.000***	.000***

Responsiveness : Willing to help customers and provide prompt service.

Note : *: p<0.05 ; **: p<0.01 ; ***: p<0.001

Table 7 2016-2020 Population Variables and Satisfaction Significance Analysis Table -

Dependent Variable: Empathy

Dependent variable: Empathy					
Independent variable	2016	2017	2018	2019	2020
(Constant)	.000***	.064	.000***	.256	.715
Job title	.658	.608	.472	.454	.049
Position	.867	.070	.211	.064	.002**
Area	.333	.001**	.009**	.000***	.000***

Empathy : Caring about giving customers individual care—customized.

Note : *: p<0.05 ; **: p<0.01 ; ***: p<0.001

Table 8 2016-2020 Population Variables and Satisfaction Significance Analysis Table -
Dependent Variables: Assurance

Dependent variable: Assurance					
Independent variable	2016	2017	2018	2019	2020
(Constant)	.152	.172	.000***	.836	.018*
Job title	.951	.228	.267	.217	.738
Position	.710	.007**	.748	.141	.001**
Area	.002**	.000***	.003**	.000***	.000***

Assurance : The knowledge and courtesy of employees and their ability to inspire trust and confidence in customers.

Note : *: p<0.05 ; **: p<0.01 ; ***: p<0.001

Table 9 2016-2020 Population Variables and Satisfaction Significance Analysis Table -
Dependent Variables: Tangible

Dependent variable: Tangible					
Independent variable	2016	2017	2018	2019	2020
(Constant)	.711	.489	.000	.421	.043*
Job title	.059	.885	.082	.524	.207
Position	.005**	.003**	.438	.184	.000***
Area	.000***	.000***	.007**	.000***	.000***

Tangible : The appearance of physical facilities, people, and written materials.

註 : *: p<0.05 ; **: p<0.01 ; ***: p<0.001

4.6 Analysis of the importance of demographic variables on after-sales

servicesatisfaction

For the purpose of this study, to explore the impact of medical equipment after-sales service customer service satisfaction on performance, a 300-point online questionnaire was distributed, and 50 valid samples were randomly selected from each of the four types of administrative personnel, technical personnel, physicians, and nursing staff as Statistical analysis, using descriptive statistical cross-analysis method to analyze the reliability, responsiveness, empathy, assurance, and tangible of each after-sales service according to different demographic variables, and present them in percentages for ranking.

The statistical results show that there are obvious differences in the ranking of the importance of different positions. The ranking of the importance of the administrative staff is reliability, empathy, tangible, responsiveness, and assurance; the ranking of the importance of the technical staff is responsiveness, reliability, assurance, empathy, tangible; Physicians ranked reliability, tangible, assurance, empathy, and responsiveness; Nurses ranked their emphasis as responsiveness, tangible, and assurance , empathy, reliability. And whether the rank of the second demographic variable is the ranks of management staff, the ranking of importance is consistent with reliability, responsiveness, assurance, empathy, and tangible. Finally, the ranking of the importance of population variables in the northern region is responsiveness, reliability, assurance, empathy, and tangible, while the middle part and southern regions are consistently ranked as reliability, responsiveness, assurance, empathy, and tangible. Statistics The result is as Table 10 - Table 14 .

Table 10 2016-2020 Cross-analysis table of demographic variables and after-sales service attention - the first attention

Demographic variables		First priority					Total
		Reliability	Responsiveness	Empathy	Assurance	Tangible	
Job title	Administration staff	78.0%	18.0%	4.0%	0.0%	0.0%	100.0%
	Technical staff	18.0%	66.0%	14.0%	2.0%	0.0%	100.0%
	doctor	82.0%	2.0%	10.0%	0.0%	6.0%	100.0%
	nursing staff	18.0%	76.0%	4.0%	0.0%	2.0%	100.0%
Position	Management	51.0%	38.8%	6.1%	1.0%	3.1%	100.0%
	Non-management	47.1%	42.2%	9.8%	0.0%	1.0%	100.0%
Area	north	39.2%	43.2%	10.8%	1.4%	5.4%	100.0%
	middle part	57.1%	35.7%	7.1%	0.0%	0.0%	100.0%
	south	51.8%	42.9%	5.4%	0.0%	0.0%	100.0%

Table 11 2016-2020 Cross-analysis table of demographic variables and after-sales service emphasis - second emphasis

Demographic variables		Second priority					Total
		Reliability	Responsiveness	Empathy	Assurance	Tangible	

Job title	Administration staff	14.0%	10.0%	72.0%	4.0%	0.0%	100.0%
	Technical staff	76.0%	14.0%	10.0%	0.0%	0.0%	100.0%
	doctor	14.0%	16.0%	14.0%	4.0%	52.0%	100.0%
	nursing staff	10.0%	12.0%	14.0%	2.0%	62.0%	100.0%
Position	Management	10.2%	34.7%	6.1%	19.4%	29.6%	100.0%
	Non-management	9.8%	52.9%	2.0%	9.8%	25.5%	100.0%
Area	north	35.1%	10.8%	25.7%	1.4%	27.0%	100.0%
	middle part	7.1%	42.9%	5.7%	14.3%	30.0%	100.0%
	south	12.5%	42.9%	5.4%	12.5%	26.8%	100.0%

Table 12 2016-2020 Cross-analysis table of demographic variables and after-sales service emphasis - the third emphasis

Demographic variables		The third priority					Total
		Reliability	Responsiveness	Empathy	Assurance	Tangible	
Job title	Administration staff	0.0%	2.0%	4.0%	12.0%	82.0%	100.0%
	Technical staff	0.0%	0.0%	2.0%	76.0%	22.0%	100.0%
	doctor	0.0%	2.0%	2.0%	66.0%	30.0%	100.0%
	nursing staff	22.0%	0.0%	6.0%	56.0%	16.0%	100.0%
Position	Management	1.0%	1.0%	6.1%	59.2%	32.7%	100.0%
	Non-management	9.8%	1.0%	1.0%	46.1%	42.2%	100.0%
Area	north	4.1%	2.7%	5.4%	51.4%	36.5%	100.0%
	middle part	8.6%	0.0%	2.9%	54.3%	34.3%	100.0%
	south	3.6%	0.0%	1.8%	51.8%	42.9%	100.0%

Table 13 2016-2020 Cross-analysis table of demographic variables and after-sales service emphasis - the fourth emphasis

Demographic variables		Fourth priority					Total
		Reliability	Responsiveness	Empathy	Assurance	Tangible	
Job title	Administration staff	8.0%	70.0%	18.0%	0.0%	4.0%	100.0%
	Technical staff	6.0%	18.0%	74.0%	2.0%	0.0%	100.0%
	doctor	4.0%	24.0%	64.0%	0.0%	8.0%	100.0%
	nursing staff	8.0%	12.0%	74.0%	0.0%	6.0%	100.0%
Position	Management	8.2%	27.6%	59.2%	1.0%	4.1%	100.0%
	Non-management	4.9%	34.3%	55.9%	0.0%	4.9%	100.0%
Area	north	9.5%	27.0%	58.1%	0.0%	5.4%	100.0%
	middle part	5.7%	35.7%	52.9%	0.0%	5.7%	100.0%
	south	3.6%	30.4%	62.5%	1.8%	1.8%	100.0%

Table 14 2016-2020 Cross-analysis table of demographic variables and after-sales service emphasis - the fifth priority

Demographic variables		Fifth priority					Total
		Reliability	Responsiveness	Empathy	Assurance	Tangible	
Job title	Administration staff	0.0%	0.0%	2.0%	84.0%	14.0%	100.0%
	Technical staff	0.0%	2.0%	0.0%	20.0%	78.0%	100.0%
	doctor	0.0%	56.0%	10.0%	30.0%	4.0%	100.0%
	nursing staff	40.0%	0.0%	4.0%	42.0%	14.0%	100.0%
Position	Management	29.6%	13.3%	22.4%	4.1%	30.6%	100.0%
	Non-management	27.5%	12.7%	26.5%	1.0%	32.4%	100.0%
Area	north	10.8%	16.2%	1.4%	25.7%	45.9%	100.0%
	middle part	21.4%	14.3%	30.0%	2.9%	31.4%	100.0%
	south	28.4%	14.3%	25.0%	3.6%	28.8%	100.0%

4.7 Conclusion

This study aims to explore the evaluation of the impact of customer satisfaction on financial performance of medical equipment after-sales service. In a highly competitive market, if companies expect to continue to increase profits and grow, the key is to improve customer satisfaction and brand loyalty. By meeting customer expectations, increasing the repurchase rate, reducing the cost of developing new customers, and expanding the differences with competitors, it is natural to pass on word-of-mouth from customers, allowing the company to continue to grow and increase profits. A comparison of the results of the 2016-2020 questionnaire survey and the 2017-2021 financial report analysis of a medical equipment case company shows that customer satisfaction after after-sales service has a positive impact on financial performance, and customer satisfaction in the previous year has an impact on the next year. Therefore, it is suggested that the medical equipment company can formulate different response plans for different demographic variables, so as to improve the overall after-sales service customer satisfaction.

Three keys to improve customer satisfaction: correctly grasp customer expectations, grasp and improve current evaluation, and regularly measure customer satisfaction. Correctly grasp customer expectations. Customer satisfaction is determined by customers' expectations of products before purchase, and the actual quality of after-sales products and customer service. The three are reliability, responsiveness, and assurance. Regression analysis shows that position and area have a significant impact on satisfaction. Managerial staff at the position are more likely to participate in equipment selection opinions than non-managerial staff. Managerial staff have

requirements for reliability, responsiveness, and assurance higher. Especially in the northern region, the most important thing is the responsiveness of after-sales service. Due to the high population density in the northern area, there are a large number of medical visits every day. If the after-sales maintenance of medical equipment is delayed, it will inevitably affect the quality of medical care provided by medical institutions. Rank and region attach importance to the project. In this case, the company can review whether to increase the number of after-sales service technicians in a specific area and continue to implement professional education and training to meet customers' expectations for after-sales service immediacy and quality management, so as to improve sales in the area. Post-service customer satisfaction.

Grasp and improve the current evaluation. According to the research results, the reliability of each year's satisfaction is the highest average satisfaction score in the five years of the survey, and the top three with the highest total scores are reliability, empathy, tangible, responsiveness and assurance. Low, and there is a clear gap between the accuracy score and the satisfaction of other items. After-sales service affects customer trust and loyalty. When customers purchase replacement equipment, they will consider whether to continue to use products or recommend them to other medical institutions. Many medical institutions in Taiwan have a large system and have branches in various regions. Therefore, whether Trust the company, and continue to choose products that will have a great impact on performance. In order to ensure the authenticity of after-sales service, it is recommended that the case company arrange advanced education and training for after-sales service engineers and regular internal audit examinations, and establish an immediate return review mechanism, and repeat inspections Case records, immediate review and brainstorming to eliminate repeated faults and errors, strict implementation of testing and quality control requirements for products and parts, and active recovery of authenticity satisfaction points. The customer satisfaction survey of after-sales service is an annual survey in the past, and it is recommended to adjust it to a quarterly survey and review. Reviewing the customer satisfaction of after-sales service in each quarter can help the company's internal management to adjust immediately, and is also conducive to the arrangement of education and training courses. The overall annual performance can be improved more efficiently.

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