

# Research on Customer Relationship Management Strategy of "Hearing Aid Fitting" Based on Refined Data Analysis

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**Abstract.** Wearing hearing aids can help hearing impaired patients enter the sound world, so as to improve their quality of life. Hearing aid fitting is highly professional and requires long-term after-sales service. This paper takes 300 impaired patients and 50 hearing aid fitters of Siemens hearing aid fitting Engineer as the research object to analyze the main influencing factors of hearing impaired patients' purchase of hearing aids and the key factors to improve long-term satisfaction. Hearing aid effect, wearing comfort and service quality significantly affect the long-term satisfaction of hearing-impaired patients. Brand, price, refined customer relationship maintenance and technical personification have a positive impact on customer repeat purchase and recommendation.

**Keywords:** Customer Lifetime Value; Personalized Demand; Refined Customer Relationship Maintenance; Service Quality

## 1. Introduction

Hearing aid belongs to class II medical devices, which is a small public address equipment for hearing impaired patients to compensate for hearing loss. Industry statistics show that in 2020, the global hearing aid market scale was US \$6.47 billion, the market scale of China's hearing aid industry increased to RMB 5.821 billion, and the market scale of China's hearing aid industry increased by 152.1% from 2013 to 2020[1]. Hearing aid fitting is a fine and professional technology deployment service. The fitting steps include: Consultation before matching; Registration of medical history, hearing aid wearing history, basic user information and other diseases before matching; Routine examination of ear canal; Pure tone audiometry, speech recognition rate test and other hearing tests; Listening report analysis; Computer programming of hearing data and fine adjustment of hearing aids; Patient audition effect (multiple hearing aids can be auditioned), Audition feedback, adjust the hearing aid according to the feedback; 9. Knowledge explanation; Patient and intimate long-term after-sales service. "Emphasizing sales and neglecting service" needs to be improved. The personification of technical innovation, refinement of customer marketing and intimacy and persistence of after-sales service of household medical devices can continuously improve customer satisfaction and realize customer lifelong value management.

## 2. Theoretical Research and Assumptions

### 2.1 Literature review

Gartner Group Inc put forward the concept of customer relationship management in 1999. Customer relationship management means that in order to maintain the competitive advantage of sustainable development, enterprises realize the lifelong value link between enterprises and customers in sales, marketing and service through the application of certain Internet and other information technologies, and provide customers with continuous, accurate and intimate customer service[2]; SAP company emphasizes that it records and analyzes the behavior process of communication, transaction and service between enterprises and customers, provides support for

refined customer demand service and long-term value link, and maximizes customer revenue[3]. Generally recognized by the industry customers are the most important strategic assets of enterprises. Enterprises mainly attract and retain customers, and establish a lasting value relationship with customers is the key for enterprises to form core competitiveness and improve enterprise profits.

The practice of enterprise management shows that the implementation of customer relationship management can bring many competitive advantages to enterprises, such as changing the traditional business philosophy and promoting enterprise management innovation. The enterprise has changed from product-oriented to customer-oriented, so that the customer relationship management system and business process reorganization, operators pay more attention to customers, maintain regular communication and interaction with customers, pay close attention to and meet the real needs of customers, and provide customers with more detailed and fast services; Help enterprises obtain lasting competitive advantages: strengthen the stability of major customers, win long-term cooperation with key customers, bring long-term market entry barriers and gradually reduce transaction costs; Continuous improvement of customer loyalty: communicate more smoothly with customers, find the most valuable customers, meet or even exceed customer needs, implement personalized and high-quality services, so that customers' needs before, during and after sales can be met as soon as possible, and further enhance customer loyalty.

Customer service is an important part of customer relationship management. It mainly embodies a customer-oriented value, which integrates and manages all elements of the customer interface in the preset optimal cost service portfolio. Any content that can improve customer satisfaction (i.e. the gap between customers' subjective perceived value "perception" and "expectation") belongs to customer service. Customer service is divided into pre-sales service, in-sales service and after-sales service. Pre sales service mainly refers to a series of service activities carried out by enterprises before customers have contacted the product or have no clear purchase desire, such as providing information, market forecast, consulting, etc. the ultimate purpose is to attract potential customers, assist customers or meet customers' needs to the greatest extent, Let customers begin to try to understand or buy the products or services of the enterprise; In sale service mainly refers to a series of service activities provided during customers' purchase, such as displaying products, patiently helping customers select goods, answering all questions raised by customers, etc. the ultimate purpose is to promote the transaction of goods or services; After sales service refers to various service activities provided after the transaction of goods or services, such as responsible for maintenance, regular maintenance, telephone or oral return visit, providing technical guidance, etc. When customers have lasting customer satisfaction due to the professionalism, quality, price, two-way communication and service of the enterprise's products or services, so that they have a preference for the enterprise's products or services and are willing to repeatedly purchase the enterprise's products or services or recommend them to others for a long time and continuously, customer loyalty behavior is formed.

## **2.2 Cognitive Misunderstanding of Hearing Aid Fitting**

Myth 1: the more hearing aids are worn, the more deaf they become. In fact, hearing aids without professional fitting (such as small pharmacies and online stores) do have the risk of "wearing more and more deaf". The hearing aid scientifically matched will not harm our hearing, but can protect our residual hearing and improve our speech resolution.

Myth 2: try on someone else's hearing aid first, and then consider matching it. In fact, hearing aids can only be worn after professional debugging according to their own hearing loss.

Myth 3: wait until you can't hear. In fact, hearing aid is a tool to assist correction. The earlier intervention measures are taken, the better the effect of hearing aid is.

Myth 4: wearing a hearing aid is like a good ear. In fact, hearing aids will make acoustic compensation according to the hearing situation of hearing-impaired patients, so as to help patients listen, but they can not replace human ears for fine processing and resolution of sound.

Myth 5: for binaural hearing loss, one should be equipped first. Binaural listening can better help us

### 2.3 Research Hypothesis

Based on the above theories and cognitive misunderstandings of hearing impaired patients, this paper verifies whether hearing aid effect, wearing comfort, brand, price, professional service, service quality and customer relationship maintenance have a significant and positive impact on the lasting customer satisfaction of hearing impaired patients through empirical analysis.

## 3. Data Collection and Regression Analysis

### 3.1 Sample and Data Collection

This paper conducts market information research by means of telephone return visit and face-to-face interview in 2020. The research subjects mainly came from 300 hearing impaired patients and 50 professional hearing aid fitting teachers in Guangzhou “Xijia” hearing aid fitting center. The survey covers customer basic information, product basic information, customer characteristics and customer relationship maintenance. There were 220 questionnaires for hearing impaired patients and 50 for hearing aid fitting teachers.

#### 3.1.1 Age and Social Needs of Hearing Impaired Patients

The age concentration of customers is 81-90 years old (25.8%), 61-70 years old (24.2), 71-80 years old (21.6%), 0-50 years old (18.8%) and 51-60 years old (9.6%). Among them, patients with hearing impairment tend to be younger and wear headphones to listen to music for a long time; The data of ear diseases in infants with hearing impairment, especially at the age of 3, are high. Hearing impairment can lead to social disorder, depression and even dementia. It is necessary to wear hearing aids in time to improve life and health[4].

#### 3.1.2 Price and Purchase Key Factors

The purchase of hearing aids for hearing impaired patients in Guangzhou is mainly concentrated in the price range of 8000-14000 yuan, accounting for 29.8%, followed by less than 5000 yuan (23.5%) and 5000-8000 yuan (21.2%). Consumers are less sensitive to the price of hearing aids, and comfort and wearing effect are the most important considerations.

### 3.2 Research Regression Analysis

#### 3.2.1 Research Variables

Data analysis shows that the satisfaction of hearing impaired patients with hearing aids for continuous wearing is mainly affected by the wearing effect (mainly including hearing aid effect, wearing comfort, etc.), service quality (mainly including professional fitting, meticulous and empathy) The impact of key factors such as long-term customer relationship maintenance (telephone return visit, free product maintenance, regular hearing retest, complaint handling, etc.) and price sensitivity (value expectation and actual perceived value).

The descriptive statistics of each research variable are shown in Table 1. Multiple linear regression analysis based on least square method was used. software spss2 1.0 was used to Process Data.

Table 1 Descriptive Statistics of Each Variable

Type	Variable Symbol	Specific factors	Number of Samples	Statistics Mean	Standard Error
Dependent variable	Y	Long Term Satisfaction	220	3.92	0.429
Independent Variable	X1	Wearing Effect	220	3.75	0.543
	X2	Service Quality	220	3.94	0.475
	X3	Price Sensitivity	220	10283.95	10143.153

Table 2 Correlation of Variables

	Y	X1	X2	X3
Y	1.000			
X1	0.486***	1.000		
X2	0.587***	0.285***	1.000	
X3	-0.074	0.038	-0.084	1.000

Note: \*\*\*, \*\* and \* indicate significance levels less than 1%, 5% and 10%, respectively.

The correlation coefficients between long-term satisfaction, hearing aid wearing effect and service quality were respectively; The correlation coefficient with price sensitivity variables is irrelevant.

### 3.3 Multiple Regression Analysis

Multiple regression analysis is carried out in this paper, and the analysis results are shown in Table 3.

Table 3 Regression Analysis Results of Overall Satisfaction

	Nonstandard Regression Coefficient (B)	Standard Error of B	Significant Level	Lower 95% Confidence Interval of B	Upper 95% Confidence Interval of B	Standard Regression Coefficient (Beta)
Wearing effect (X1)	0.273	0.049	0.000	0.181	0.370	0.348
Service quality (X2)	0.441	0.056	0.000	0.333	0.549	0.488
constant	1.171	0.237	0.000	0.705	1.637	1.171
R <sup>2</sup> Correction value	0.748					
Model significance level	0.000					
Standard Error of Y Predicted value	0.319					
N	220					

Calculated from table 3, The correlation coefficient between wearing effect and service quality is 0.748, which has a high degree of fitting, the effect is obvious. Hearing aids have a high technical content and have a significant effect on solving the social needs of hearing-impaired patients. Consumers buy a series of value programs related to hearing: they will hear better, delay the decline of auditory nerve function, feel better, and improve their social life. Therefore, the wearing effect has the greatest impact on customer satisfaction and recommendation rate. Secondly, professional

service, high-quality service attitude and long-term customer relationship maintenance are also very important. The price sensitivity of hearing aids is relatively low.

The research shows that the regression equation is:

$$Y=0.273X_1+0.441X_2+1.171 \quad R^2=0.748 \\ (8.053) \quad (5.738)$$

## 4. Conclusions and recommendations

### 4.1 Conclusions

When hearing impaired patients buy hearing aids, the price sensitivity is relatively low. The impact of hearing impairment on patients' social life is too significant, which urges consumers to give priority to brand and wearing effect when purchasing hearing aids.

Wearing effect and service quality have a significant impact on the satisfaction of hearing-impaired patients with continuous wearing. Inconvenient store location, unprofessional fitting, unfriendly service, and disregard of customer applicability will lead to serious mistrust and negative experience for hearing-impaired patients, and refuse to wear them for a long time, recommend them to others, and return to the store for free maintenance.

Long term intimate and refined customer relationship maintenance is an important factor for hearing aid fitting to maximize customer life cycle value. Regular telephone follow-up, establishment of close friends and free in store product maintenance will greatly extend the customer's life cycle value and improve the customer recommendation rate.

### 4.2 Recommendations

The customer relationship management of hearing aid fitting must be carried out from a strategic perspective[5]. The core is to make a long-term evaluation of the customer's value according to the personalized needs of hearing impaired customers and combined with the customer's life cycle of using hearing aids, make key investment to key customers, maintain a long-term fine and intimate relationship with customers, and maximize the customer's lifelong business value.

Establish fine customer files and closely combine personalized and standardized services. Conduct one-to-one case management for customers according to customer consultation status and continuous follow-up. The sales of hearing aids is only a carrier for hearing aid fitting engineers to provide solutions according to the actual condition of customers. The key factor is to classify and manage customers at different levels, clarify customer status and customer value, establish perfect customer insight, find problems in service, establish standard processes for customer pre-sales, sales and after-sales service, and configure targeted fitting service and after-sales service. A professional customer service department must be established for hearing aid products, and a perfect customer information management system must be established, covering the basic customer name, age, home address, payer, fitting time, product model, purchase unit price, purchase reason, hearing impairment symptoms, other relevant information, such as wearing effect, service attitude towards hearing aid fitters, technical professionalism Whether to explain the precautions, return to the store for maintenance and hearing retest. Make full use of customer database to realize one-to-one fine management of customers, continuously improve customer satisfaction, realize customers' multiple purchases and good word-of-mouth recommendation.

Continuously improve the professional service of hearing aid fitting division, "sales empathy service value", adjust the concept of hearing aid sales, inquire and diagnose according to the actual situation of customers, understand the needs and psychological feelings of customers, and recommend long-term value solutions suitable for customers' economic level and hearing level to customers, so as to achieve win-win interests of both parties.[6]

Professional hearing aid fitters should recommend appropriate hearing aid models that adapt to the economic level of customers, rather than selecting low-cost hearing aids only according to the

requirements of most customers. As mentioned earlier, most of the patients who buy hearing aids are elderly people over 60 years old. They often simply think that hearing aids are a sound amplifier. As long as they can hear the sound, their sensitivity to price often exceeds the requirements for the quality of hearing aids. In fact, hearing aids with higher prices have more channels, more performance, and finer sound processing, which can improve the comfort of listening to sound. Compared with cheap hearing aids, their speech intelligibility is also higher, resulting in higher customer satisfaction. After professional hearing test and analysis, the hearing aid fitting technician will provide customers with hearing aid matching scheme with higher value and performance according to their economic affordability. When customers wear hearing aids, the faster they adapt, the more satisfied they are with the wearing effect, and the higher their satisfaction and loyalty to the selected hearing aid brand and the hearing aid fitters who provide services.

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