

The Sustainable Management of the Service Center for High Tech Industry in Asia – A Case Study of Mio-TECH

Min-Jen Tsai

*Assistant Professor, Institute of Information Management, National Chiao Tung University
mjtsai@cc.nctu.edu.tw*

Abstract — In the past, enterprise needs to invest a great deal of tangible assets such as: lands, labors, facilities and factories in order to reach certain scale of economics and acquire the competitive advantages. However, in this information rich era, enterprise's direction of strategic thinking has shifted from the production orientated model to the customer orientated approach, and it needs to provide differential services to avoid the cutthroat price competition. Owing to the demand of customers for immediate and reliable consulting service, the establishment of call center becomes the communicative bridge between enterprise and customer; to date, call center even became an important link in the market competition. Building an excellent call center is the essential move to implement the customer relationship management, and providing meticulous concern for customers is the key to improve customer loyalty.

In this study, Mio Technology Limited (Mio-TECH), a manufacture of portable electronic navigation devices, is taken as an example of case firm to explore the organizational system and management of its call center since the enterprise has evolved its service models based on the product features to enhance the business planning. To view from the management aspect, the current call center has emphasized the integration of resources and professional division of work. Therefore, the call center utilizes the applications of communication and computer technologies to automatically handle the great quantity of works; and implement the competitive human resource in China region to cooperate with Mio-Tech's headquartered in Taiwan to build good customer relationship for worldwide users.

This paper analyzes how Mio-Tech's call center improve the customer service in terms of strategy, technology, manpower and procedures and has found that the technical enhancement, the customer's expectation and the corporate strategy have been significantly communicated and leveraged into a sound customer relationship management system.

Keywords — call center, customer relationship management (CRM), outsourcing

I. INTRODUCTION

High-quality products may attract customers, but good service is the prerequisite to establish the long-term relationship between enterprise and customer. Recently, with the enterprise focus towards the customer service, call centers has become an important information source of customer relationship management (CRM)[1-3]. As the

literal meaning of CRM which is keeping good relationship with customers; broadly speaking, it indicates that making good quality of customer service, enhancing customer satisfaction, keeping customer loyalty to enterprise and further advancing future reliability of customer. It provides a wide spectrum of arranging measures for relevant departments to offer customers excellent service quality, and its main purpose is to maintain customers who have contributed to enterprise [4-7]. Therefore, build the customer information database is the first step to develop CRM [8-10]. In terms of the application of information management technology which mentioned in the book, "Business @ the Speed of Thought: Using a Digital Nervous System", the analytic capability of data mining is an important issue in CRM [11] and CRM is used by information technology to interact between the clients and the enterprise with integrated tools. Based on this principle, the business marketing strategy is to evolve into a better one-to-one marketing[12].

The case firm of this study is Mio Technology Limited (Mio-TECH) which is a supplier of portable electronic navigation devices including smart phone, pocket PC, and portable navigation device (PND) with its own brand: Mio Digi-Walker™. The operation sites of Mio-TECH are distributed over regions in Taiwan, China, US, and Europe. As for its service sector, it provides quick product information and application inquiry, as well as multilingual service web pages that allow consumers all over the world to share with the ubiquitous service through its fast and convenient maintenance service online, 0800 (toll free) service hotline or call center service.

The call center establishment was designed according to the requirement from its OEM client, Dell Computer Corp during the initial stage. While Mio-TECH has its own brand, the call center gradually transformed from B2B into B2C model with comparative amendment for its operations. The call center possessed its own professional competence as a result of many years of serving in OEM market; however, with making responses to the new market, it needs to redefine the service indicators and educational training for customer service personnel, etc... Since the product is more complicated than general consumer electronics through the technical aspect, it is not suitable for outsourcing service. Therefore, this study will address those issues and explore in three directions respectively, such as establishment of

human resource (HR), procedure planning and system management of the call center.

This paper will be organized as follows. The literature review will be explained in Section 2. Section 3 will demonstrate the methodology implemented in this study and the empirical findings will be shown in Section 4. Discussion, implications, and contribution are in Section 5 and conclusion will be in Section 6.

II. LITERATURE REVIEW

CRM is an important mechanism for enterprise, which business model has evolved from production-centric to customer-oriented approach [2]. According to the researches of Gartner Group, CRM can be divided into the following 4 cycles:

TABLE 1. CRM CYCLES

<p>1. Knowledge Discovery Analyze customer information to ensure whether enterprise's marketing strategy is correct or not, and start to make market segmentation and customer prediction. Benefit of this phase will enable marketing personnel to understand the customer behavior patterns and make them to propose better decisions.</p>	<p>2. Market Planning Define products, plan entire channels, schedule, marketing set planning, assist marketing personnel in analyzing relevant channel preference, event-related inducement, and competitive advantage/disadvantage analysis</p>
<p>4. Analysis & Refinement Analyze the difference between the empirical and predicted results and amend the sampling rules from knowledge database to attempt the modification for better realization of the customer expectation in the market</p>	<p>3. Customer Interaction Implement communication channels with business customers, which includes potential buyers, and call center is the interaction window during the contact</p>

Data mining is the foundation of business intelligence in CRM. In terms of CRM's questionnaire analysis, data mining is the core technique which is able to analyze and transform corporate internal data into the analyzable format. With capability of storing a great deal of customer information that provided by data warehousing, data mining is not only able to accomplish the accurate marketing policy in the target market, but also able to make analytic report to be customized and enhance the hit rate of marketing in the target market. After sound analysis and familiarity with the customers, CRM is able to efficiently build relationship with customers and further propose the effective marketing plans for corporate. Furthermore, the enterprise need not loosely focus its customers to waste its marketing cost, and it will enable different service strategies for different customer groups in order to strive for the maximum profit.

How to improve customer satisfaction is an important issue for every enterprise, especially during the growth phase of operating scale. Enterprises need to provide fast and accurate customer service to maintain its goodwill and customer loyalty. Under this purpose, a call center is built as a communication bridge between customer and enterprise.

Its service items include product inquiry, commodity marketing, and maintenance service...etc. In the past, enterprises were production-oriented in Taiwan while their service models were OEM/ODM generally. That is, the external marketing as showed in Figure 1 is focused [13] and only emphasized on how to provide excellent quality control (QC) for mass production with high-quality OEM products to clients. However, "service" becomes the main priority of customer demand nowadays. Under the pressure of profit-seeking, enterprises' OEM model of earning profits from international manufactures has shifted into the operation of ordnance bench mark (OBM) for the case firm Mio-TECH. Furthermore, the interaction between employee and customer has come with the tide of fashion, thus interactive marketing became an important management issue. Since enterprises need their personnel to interact with customer end, how enterprise would possess high quality customer service personnel with high customer satisfaction has also become a key topic in internal marketing. After carefully examining the golden triangle in Figure 1, the company/employee/customer relationship is truly symbolized and will be discussed in this study for the case firm.

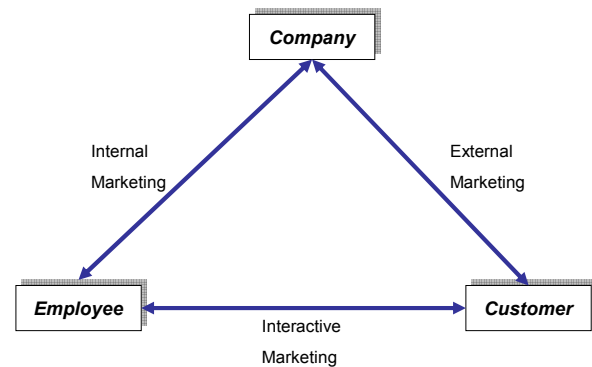


Figure 1. Service golden triangle

III. METHODOLOGY

Exploring from the business model of call center, CRM needs to adopt strategy at the starting point of planning, and then define necessary technology, staffs and operating procedures to cooperate with strategy. Therefore, these 4 items: strategy, technology, staff and operating procedures are the keys to make planning [14].

A. Strategic Facet of Call Center

With the concept of orientation towards customer service emphasized by enterprise, call centers become an important information source of CRM. The "PEPSI" Model [4] of CRM strategic development cycle for enterprises can be categorized into the following 5 steps:

1. Corporate Position and Value Proposition: every enterprise needs to determine its own position and core value of its products, as well as integrates its marketing and business units into a package of service to fulfill the customers' expectation of enterprise image.

2. Experience of Customer: Enterprise should be able to use the information technology to accumulate the experiences and suggestions from customers, such as the online FAQ (Frequently Asked Questions) help website. As a result, it will reveal very precious information for users for inquiring which will also simplify the inquiry requests for the call center
 3. Product, Process & Channel: As for building good relationship with customers, it needs to interact with customers and lead them to enterprise's call center, or via the official website for service which effectively save a great amount of expenses.
 4. Segmentation: The purpose of building CRM for enterprise is providing customers a customized service, and further to develop the additional services for customers. According to customers' characteristic, demand and their experiences, enterprise shall segment and categorize them in order to provide more appropriate service, to establish service that more suitable for different customers, and to enhance customer satisfaction, or, even further to discover the potential customers and to prevent existing customers from flowing away.
 5. Capability of Information: As for categorizing the customers, it needs to design appropriate procedures for conducting the analysis of "consumption behavior" to achieve better decision and make an effective use of the information.
3. Capability of Troubleshooting: The capability of the vendor's support is an important factor to reduce the loss and timely restore the normal operation during system malfunctioning.
 4. Integral Planning Capability: System platform shall be built in module format and provide the scalability when enterprise needs to expand the system functionality for the competitive environment.
- Information technology is the critical factor that related to the success of CRM for the customer information management and analysis. On the other hand, well-developed information technology enables the enterprise's marketing capability to make a rapid response.

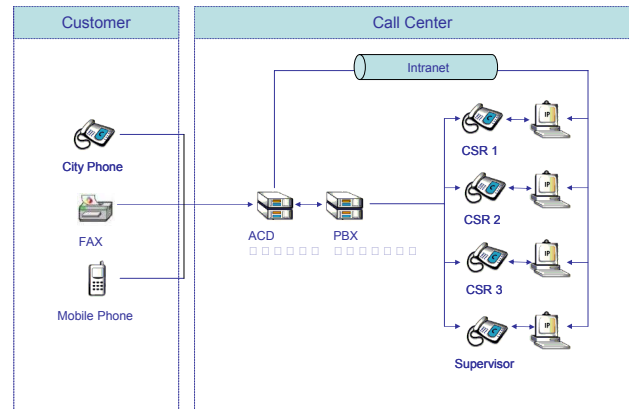


Figure 2. Information technology for call centers

B. Technologic Facet of Call Center

While customers dialing the toll free number to contact the service personnel, the voice interaction will undergo the following systems: ACD (Automatic Call Distribution), IVR (Interactive Voice Response), and CTI (Computer Telephony Integration) as shown in Figure 2. Such a system will allow customer service personnel to perform his/her own professional competence including business product advertising, customer information exchange, maintenance service, complaint handling ...etc. In addition, the complicated professional knowledge can be organized and updated in the FAQ database for future use[15-19].

During the planning stage of the call center, the enterprise needs to make a long-term schedule of operation direction, to retain the capability of future expansion and to avoid the repeated investment that may further affect customer's rights and interests. Therefore, following items should be considered:

1. Experience of Hardware Vendors: The experience and reputation of the system vendors is the important indicator to ensure the quality and performance for the call center construction under limited budget.
2. Integration Capability of the Software and Hardware: Integral customer system has covered computer, database, communication and network, which will not be completed with just simply implementing a single solution. Each key technology has its own professional competence, thus the integration capability of system planning and establishment is very crucial to the entire system's success or failure.

C. Human Resource Facet of Call Center

Human resource (HR) management is able to help call center to effectively plan the work load for service personnel and reduce the waiting time for users. In addition, enterprise's product characteristics, users' behavior and budget control all affect the HR and following 5 items are considered for HR management:

1. Who? Who will call? It needs to identify the inbound calls from customers who already owned enterprise's products, or the potential buyers. Call center shall provide different service content with aiming at different group of customers.
2. What? What's purpose of this call? If the question relates to the product issues, any suggestion or report is needed for the support team to evaluate for improvement.
3. Where? Dialing routes of users to the call center are mainly the city phone, mobile phone, Internet phone (VoIP, Skype) ...etc. Each route reflects different cost for the call center.
4. When? When will call? From the historical data, it can be known about the peak and off-peak periods of customer calls. And the close relationship may be found from the requests stimulated by the marketing activities.
5. How? How to solve customers' problems? The skill level and SOP of service personnel will affect the average length of response time. The solution regarding to each call will be based on the perfect FAQ database and the regular training for the service personnel.

Effective dispatch of the on-duty customer service personnel becomes the key to enhance the efficiency of call center. It is very common to increase the number of customer service personnel on duty during the peak season, and arrange the on-site training during the off season between the shifts. Call center's superintendent shall consider the overall amount of calls to distribute the number of agents, meanwhile, he/she needs to estimate whether any related activity that results in increasing/decreasing the amount of traffic at current period. Therefore, according to company's policies, the shifts for personnel may be differed from 24-hour and day shifts. Moreover, the respondent group commonly has 2-shift, 3-shift and overlapping shift, but it needs to make proper amendment due to the actual traffic daily.

Call center is a department where the communication becomes its major product, and customer service personnel play the key role in it. Selection and incubation of talented personnel is very important to maintain the good communication quality and the following 2 issues should be considered:

1. Recruit suitable customer service personnel

Customer service personnel who generally perform the first contact with customers shall have certain understanding level on his/her company's products. Thus the first step for incubating professional skills is to pick up the right staffs with associated education or similar working experiences.

As for the working capability, it mainly focused on the voice, tone, warm-heartedness and good temper under pressure. While analyzing the personal characteristics of these above mentioned key items, the administrative unit can have a clear picture for job dispatch among personnel. Some are suitable to directly interact with customers, and some may be ideal for the support work behind the scenes.

2. Incubation of customer service personnel

The intention of customer service is to solve the problems that requested from users, thus the incubation of problem-solving capability for customer service personnel is his/her professional competence which includes the familiarity with product specifications and working procedures, the conversation manners for clear explanation. Unqualified service personnel should be quickly identified for further training or transferred to other department in order to maintain high quality service standard.

We may frequently hear about the customer dissatisfaction with products, and they may dial to the call center for complaining the after-sales service. Professional competence of customer service personnel shall not only possess good communicative skills to moderate customer's mood, but shall possess capability to handle the emergency and business negotiations to achieve the goal of support and enhance satisfactory benefit for customers [20,21].

D. Measurement Indicator of Call Center

The performance of organization behavior needs to be evaluated through indicators, that is, by means of an evaluating system with quantified methods to measure the performance of regular operation, and tools that commonly

used to determine the organization performance of individual (such as: single customer service personnel) and team (entire call center). The indicators can be quantified into following three categories for discussion.

1. Performance Evaluation

Since call center is a work place full of pressure with faster pace, it is very important to have effective communication schemes for conversation. There are 8 performance indicators for call center as follows:

1. Average response speed
2. Average handle time
3. Average abandon rate
4. Average waiting time
5. Resolving rate per call
6. Utility rate per on duty agent
7. Average cost of amortization per call
8. Average quantity of calls handled by each on-duty Agent

2. Integral Quantified Indicators

We may set the service indicator (service level) as the percentage of receiving customer's call within 5 seconds or 5 times of rings for the customer service personnel. Actually, this is the most common used indicator for every call center. If this indicator falls below this level, additional personnel are needed.

George Baldino[4] has pointed out the following 7 points which are able to enhance the indicator of customer satisfaction:

1. Support from High Level Management: High level management plays a key role in customer satisfaction since each improvement solution usually needs the interdepartmentally collaborative operation, and the managing authority's support and promotion is able to carry out the project more smoothly.
2. Design Exclusive Solution: According to its product characteristics and consumer behavior, every enterprise shall develop a set of exclusive customer satisfaction measurement solution. While some enterprises are divided similar customer groups in the same market, the measurement solution that is suitable for firm A may not suit firm B due to different business procedures within the corporate.
3. Understand Customers: Without understanding the customers, it will be hard to achieve the customer satisfaction since there is no indication of meeting customer needs. The most effective way to understand customer is through customer's feedback, and the most common approaches are the in-depth interview and the focus group.
4. Benchmarking: In general, it can be divided into internal benchmarking, industrial benchmarking and competitive benchmarking. Even the evaluation results of the customer service shows improvement by internal benchmarking, the improvement from external benchmarking will be more objective.
5. Draft of Action Plan: the enterprise should propose the draft of action plan through cross department study for

customer satisfaction. The detailed procedures are needed for implementation.

6. Continuous Improvement: Customer satisfaction measurement should be conducted continuously. The continuous improvement of customer satisfaction ensures the company's future competitive advantage, and make sure of its products that conform to customers' expectation.
7. Understand the difference between Customer Satisfaction and Customer Retention: Even there's a significant correlation between customer satisfaction and customer retention, it still need to emphasize that the measuring indicators shall be determined differently by other study.

3) Individual Quantified Indicators

The routine works of the customer service personnel include the number of calls received by a person per day, average communication time per call, frequency of updating knowledge database, hours of education training. Other related quality indicators include the conversation manners, tamper, call receiving skills, and professional knowledge. The quantified indicators of the performance evaluation can be judged by two categories: internal self-grading and external grading. Such indicators abovementioned can be supported through ACD (Automatic Call Distribution) system and the monitoring system with customer satisfaction survey for internal grading. In terms of the external grading, through system's voice recording, it may conduct the random inspection for on-duty agents. The inspection items include: whether they follow the criteria to answer customers, whether the respondent answers need further follow-up, and to know any relevant aspect that needs to be improved. According to enterprise's short-term or long-term goals, such as enterprise's strategy and operation performance, all evaluation mechanisms should be examined from top to bottom levels. Furthermore, compactly integrating with related units, resources and procedures within enterprise will make the performance evaluation to be objective, fair and conform to the long-term benefit for enterprise.

IV. EMPIRICAL FINDINGS

The case firm established in 1987 and locates in the Science-based Industrial Park in Hsing-Chu, Taiwan, which was mainly engaged in PC production and manufacturing during the early stage. In recent years, the corporate product line has expanded to the digital home appliances, high-end server and portable digital assistant related products.

Its headquarter is located in Neihu, Taipei City and has many foreign business branches in US, UK, German, Belgium, Japan, and China. As for its production sites, Hsing-Chu factory in Taiwan is responsible to implement new products and manufacturing of high-end products; Guang-Dong factory in China produces motherboard, desktop computer, workstation, server,... etc. Jian-Su factory

in China manufactures wireless communication products mainly, such as navigation products (GPS), pocket PC, and smart phone. Furthermore, its core competence has been transformed from the early production and QC, R&D focus into OBM operation.

In such a severely competitive environment of micro-profit era, enterprise has encountered the threat from many external factors in the aspect of making profit, such as: too many substitute products, threat from homogeneous competitors, unpredicted change in consumer behavior, threat from new technology industries and the capability of price negotiation. According to SWOT Analysis in TABLE 2, Mio-TECH has many advantages like the largest market share in Taiwan with high quality products. However, it also need strengthen product maintenance in the scope of after-sales service for GPS products. The quality, service speed and cost of maintenance have been emphasized as the most important issues in services. This study will focus on the establishment of related systems and specifications for Mio-TECH call center in China region, and the service indicators generalized for the specialty of navigation products.

TABLE 2. SWOT ANALYSIS OF THE CASE FIRM

	S Strength	W Weakness
	S1 Taiwan Car GPS Market Share No. 1 S2 Many Agents S3 Developed with hardware vendors with excellent QC	W1 No exclusive service branch to conduct the rapid promotion and localized activities W2 Long waiting time due to the outsourcing of Maintenance service
O Opportunity O1 High growth of car navigation system	SO: Strike 1. Diverse Mio products with completed low to high-end products 2. Integrate mobile phone with electronic navigation system	WO: Strategic Alliance 1. Vertical link of the collaborative firms engaged in telecommunication, car service and car stereo 2. Participating major GPS discussion groups
T Threat T1 Low difference between homogeneous products T2 Potential competitors into the market.	ST: Turning point 1. Collection of updated touring information 2. Upgrade the hardware with new specification 3. Update the latest map information	WT: Defense 1. Knowledge data base updated quarterly

The TABLE 3 statistics are analyses of case firm's competitors in Taiwan region. As for the on-line inquiry service about the maintenance condition, there's no such competitor who possesses the relevant customized service up-to-date. This unique service strengthens Mio-TECH customer satisfaction and the detailed will be explained in the following.

TABLE 3.SERVICES OFFERED AMONG COMPETITORS (DATA COLLECTED BY THIS RESEARCH)

Firm	HP	ASUS	GARMIN	Mio-TECH
Years of Warranty	1 year	2 years	1 year	24 month
Warranty Contents	a. Free parts replacement b. Free maintenance c. Free home pick-up and delivery	Any failure occurred under the normal operation (non man-made factors) within the warranty period, ACER will responsible for all expenses incurred by maintenance and parts replacement.	Any failure occurred under the normal operation and it determined as the device problem, then the manufacturer will bear all responsibility within the warranty.	Any failure occurred under the normal operation and it determined as the device problem, then the manufacturer will bear all responsibility within the warranty.
Home Pick-up	Yes	N/A	N/A	Yes
Global Warranty	N/A	N/A	Yes	N/A
Name of Upgrade	HP care pack	N/A	N/A	Home Delivery Repair
Upgrade Service	On-site response on next working day. The scope of coverage includes all necessary parts and materials.	N/A	N/A	Immediate pick-up after phone registration, 3-hour special engineer will conduct the preliminary on-line troubleshooting via phone. The scope of service covers the services of hardware recovery, troubleshooting and software upgrade
On-line Inquiry	N/A	N/A	N/A	Official Web Page
No of Maintenance Center	4	9	N/A	29 (Lemel)

• Customer service promotion

In Feb. 1st, 2006, Mio-TECH provided users in Taiwan region with a member-only customized service, named "Mio Home Delivery Repair" (code name ERMA) which is able to simplify the maintenance procedures. This promotion integrated the logistic planning with the home pick-up service and customers don't need to go to the maintenance site for service. They can easily get the service of maintenance, the process inquiry and troubleshooting through Mio-TECH call center to assign the pickup and return schedule, for example. A flowchart of the promotion is in Figure 4.

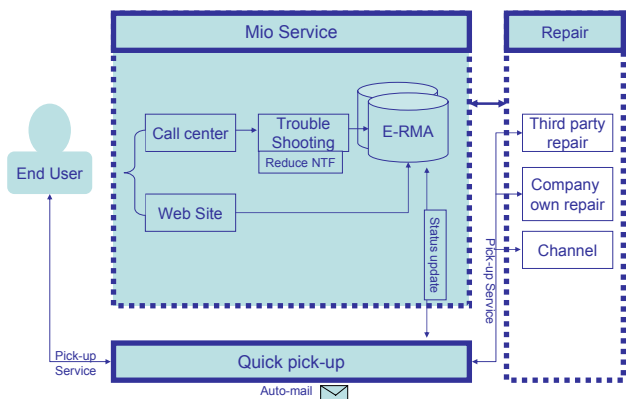


Figure 4. Case firm customized maintenance procedures

The case firm has cooperated with logistic industry, when customer's request for returning product back to the manufacturer. Customer may apply the "Home Delivery Repair" service via call center or network, then the call center will register the customer contact information and maintenance details for customers. At the same time, the manufacturer technician will make a phone call to help the user and decide whether the problem can be solved during the on-line troubleshooting. If the engineer confirms that product should be returned for repair, the manufacturer will immediately inform the logistic agent for the product pickup. The procedures can be showed in Figure 5.

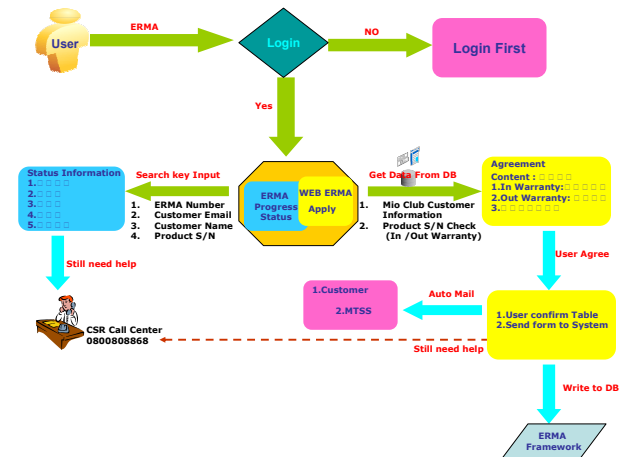


Figure 5. The procedures of the customized request

In order to understand the satisfactory condition for the registered customers who have used such a service, a customer survey cross Taiwan is conducted and hopes to realize the customer behavior and customers' expectation of the after-sales service. Scope of the survey is designed for the existing customers and the key points to inquiry are:

1. How do you know the service of "Home Delivery Repair"?
2. Impression to "Home Delivery Repair" service and suggestion
3. Customer data update
4. Overall satisfaction with Mio-TECH

Under the sampling error is $\pm 3\%$ within 95% reliability, the sample size of completion should have at least 160 copies. The survey duration is from March 1st to March 20th, 2006. Within 3 weeks, there are totally 250 person responds and the affective reply is 175 persons where Male/Female ratio is 138/37. From the survey, 97.2% customers who used the service are satisfied with such a service. Since other vendors haven't provided similar services, this customized service has become a unique tool and useful show case during the market promotion.

Even the call center implemented the customized service for only 2 months, and the related operation procedures will be gradually amended in the follow-up review meetings, over 90% of them are satisfied with this service. However, the data shows the usage of the new service is only used by less than 30% of total users. The reason might be caused by insufficient advertisement within such short period. Therefore, the case firm will try to enhance the utilization ratio of "Mio Home Delivery Repair" and improve the professional competence in hardware maintenance for customer service personnel.

• Employee Evaluation

Customer service personnel are on the first line of service and the work pressure came from customer directly. Therefore, the HR cost will also higher than other sectors in the enterprise. In the call center, a department with high pressure of work, the average HR turnover is 300% annually. That is, there will be 3 rotations of new blood in one working year, thus the demanding aspect of education training and incentive system is relatively important. As for the incentive methods, it needs to setup the practical rewards such as bonus and vacation, and as to the mentally aspect, job promotion and public praise can be adopted.

Since customer service personnel are representing their enterprise, in order to have consistent enterprise image, they shall demonstrate the standardized conversation skills and manners during the communicating with customers. Due to the fact that the characteristics of every product are varied, the standardized respondent wordings shall be defined. To ensure service contents provided by customer service personnel that are acceptable by customers, management personnel will make sampling picks from the recorded conversations or monitor the lines of in-progress conversations to conduct the monitoring and quality analysis. A sample of the monitoring is shown in Figure 6. As for the service standards of Mio call center, each customer service

personnel shall be inspected with sampling check more than 3 times per week, each time shall have the writing record. If the score is lower than the acceptable standard, an interview will be conducted by higher level manager. In addition, if bad service record occurred within 2 consecutive weeks, the post of the frontline customer service personnel will be relieved and reevaluation will be examined. Further training might be needed before the personnel return to the work position.

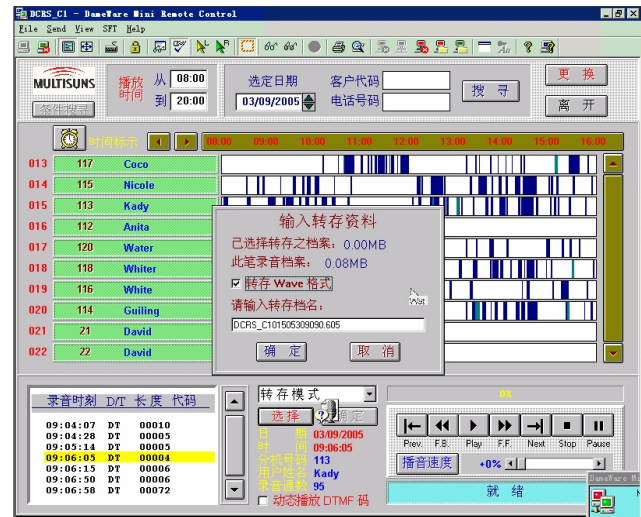


Figure 6. A sample of the monitoring mechanism

• Employee Education

From Mio-TECH's experience, effective dispatch of customer service personnel becomes the key to enhance the efficiency of call center. It is necessary to increase the number of customer service personnel on duty in the peak season which can handle more requests from customers. During the off-season, it is also required to assist the service personnel for training during the shifts. The education can help the personnel to learn the characteristics of new products in the next market phase and prepare for the FAQ in advance. In addition, it depends on the historical information and analysis of marketing plan to carry out the education schedule. Figure 7 illustrates the historical data of call answered in Mio-TECH and related job training is performed.

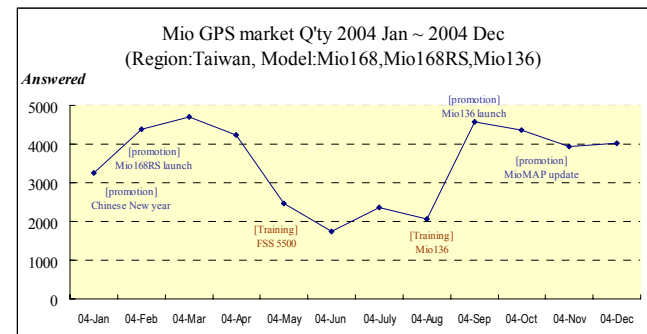


Figure 7. Historical data of call answered in year 2004. Training schedule is also planned.

V. DISCUSSION, IMPLICATION AND CONTRIBUTION

Service scope of call center can be divided into two directions: receiving service (inbound) and dialing service (outbound). The main performance indicators of the receiving service are successful respondent rate, abandon rate, and average conversation time. On the other hand, the main performance indicators of the dialing service are the sales amount within a certain period and development of potential customer roster. Those indicators should be examined carefully. For example, if it only views the average handling time, such measuring criteria may cause single data's growth which will result the customer service personnel in trying hard to end the conversation shortly in order to receive more inbound calls. That is, it will lose the actual satisfaction under CRM. Therefore, some enterprises will ask for the outsiders to conduct the satisfaction survey (out-bound) for its internal telemarketing (in-bound) of the call center. An internal inquiry system is shown in Figure 8 for illustration purpose.

Daily Report :			
项目	8390-China(350)	Mio-TW(360)	Total(Average)
1. Total Calls In	64	109	173
2. Abandons>20	0	1	1
3. Calls Answered	62	107	164
4. Calls In(excluding abandons>20sec)	64	107	173
5. % Aband	.0 %	.9 %	.5 %
6. Average Waiting (sec)	73	31	52
7. Service Level	95.2%	98.0%	97.0%
8. Agents On Queue	2	4	6
9. Average Calls Per Agent	31.0	25.5	27.3
10. Total Calls Logged	33	33	66
11. % of Total Calls Logged	53.2%	32.4%	40.2%
12. Average Communication (sec)	199	149	168

客服人员接听状况 :		
客服人员	接听数	接听时间
781	22	45分 12秒
1980	7	1小时 3分 32秒
3133	22	1小时 9分 32秒
3233	35	1小时 9分 34秒
4892	24	58分 8秒
5934	15	36分 47秒
6692	8	37分 50秒

Figure 8. Inquiry system of performance indicators

The amount of inbound calls is unpredictable, and it is totally depended on customer's action, thus planning and deployment of service personnel and facilities are very critical to the operation cost of call center. Service indicators (service level agreement) are the referential basis that used to measure passive telemarketing center, and it is able to determine whether the deployment of customer service personnel is sufficient to handle the call traffic; on the contrary, if it deployed too many customer service personnel that will increase the total idle time and cost as well. The basic criteria of measurement include:

1. Average Handle Time (AHT)
2. Abandon Rate
3. Average Waiting Time (AWT)

In order to avoid customers from abandoning their calls after a long period of waiting that may generate the negative impression for this company, for example, anti-sales promotion may occur, enterprise should offer better customer service as soon as possible. Besides, the threats of many replacement products, price competition for homogeneous products, consumer behavior change, short life cycle of products, and new technology products are all

competing in the same market nowadays. If the enterprise is not able to maintain its brand image with follow-up service, the enterprise may possibly encounter the predicament of losing its customers. Thus, to improve the after-sales service can be the first move for increasing the competitive advantage for the company which will also strengthen customer's loyalty. To achieve such an ideal, Mio-TECH's call center has following self-established service indicators:

1. Cooperate with enterprise's integral strategy to continuously develop the customized service for products.
2. Enhance the satisfaction level of customer service and reach the leading position in the industry.
3. Improve the customer service effectively and efficiently control the cost.
4. Realize the update of knowledge and skill for all customer service personnel
5. Enhance the customer satisfaction and contribute more value to the enterprise.

The Trend in the Service Center

Along with the globalization, the transformation of internationalization for enterprises is also needed in order to broaden the business territory. In order to get close to serve customers and save communication cost, many enterprises choose to seek the outsourced call centers and maintenance sites locally. Due to the culture and social customs in every region are different, so dose the sales strategy. Such an approach causes the enterprise to monitor many call centers and the headquarter needs to provide the technological support and establish the marketing strategy. This kind of operation model may derivate different customized services to different product characteristics.

For the case firm, the production of car navigation system is in China and the marketing and R&D units still retain in Taiwan's headquarter. Unlike the previously mentioned model, the case firm authorize its branch companies to build the service channel according to the market scale, for example, self-built call center, maintenance site or outsourcing professional call center. Therefore, as for the appointment of local management, customized service will be a key point to enhance the service indicators.

Regarding the product characteristics, the utility and precision of e-map are the service keys to such an electronic device. Under such condition, there are trends in the service center as centralization, customization and horizontal alliance and will be explained in details.

1. Centralization

To respond to the rapid development of Internet, service personnel in different regions can use the same system via the communication service through the Internet. The enterprise is able to establish more quantity and higher quality call centers in the regions with lower HR cost to provide customer service in other regions. The ACD can automatically distribute the request to the proper service personnel. For example, the integrated call center can enable the call center in China to serve the customers in Taiwan and

China as shown in Figure 9. Figure 10 demonstrate more detailed request flow between IT modules.

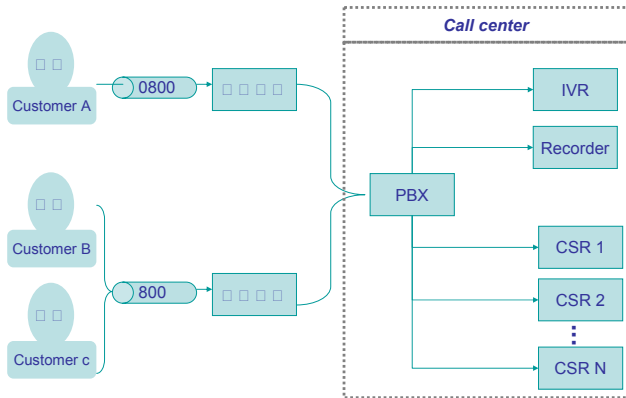


Figure 9. Case firm integrated call center diagram

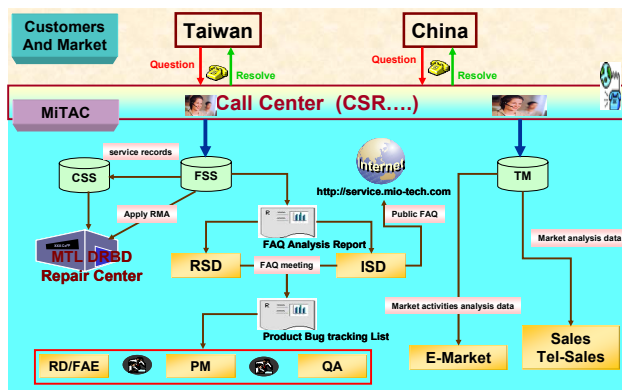


Figure 10. Detailed request flow between IT modules.

Similar implementations are also applied for many international companies which setup their call centers in India for English-speaking service. Many European language speaking international companies setup their companies in Czech where they can integrate the local low HR cost with centralized hardware facilities to provide the integrated service.

2. Customization

Under the intensive competition of marketing, customized customer service will become the critical factor to gain advantage for customer satisfaction. The role of call center is no longer passively receiving the customer's inquiry and it begins to transform into actively perform the playmaker position for product sales. Since the customers are intolerable from fraudulent calls and reluctant to receive the outbound service from the traditional call center, the outbound service of the case firm focuses on the contacting with agencies who are participating the product development in its business unit and the customer information update for market unit. The diversification of the services from the service center retains its flexibility for different variety of customers.

As for the reengineering of call center's procedures, the direction of implementation is usually focused on enhancing

the service quality and reducing operating cost. Due to the customers' demands are varied according to the characteristics of products, the enterprise should cooperate with professional and reliable resource distribution as the basis of proposing the customized service to customers. Certain business operations shall be adjusted and modified for the integrated service which is very crucial for the success of the business reengineering.

As the example of the "Mio Home Delivery Repair" (code name ERMA) from the case firm, the planning, testing and launching take about 2 years before it finally online for operation. The survey study shows the differential and diversified customized service offers better custom satisfaction.

3. Horizontal Alliances

The so-called strategic alliance (horizontal alliances) is virtually integrated with common marketing activities from two different industries. From the value chain point of view, the collaboration creates a win-win situation for both of them.

The partners of the strategic alliance can be in different industry or the same industry. One situation is the cooperation between the competitors that have common target in the same market to ally with minor competitors to strike on their main competitor. The other situation is Co-Branding which are two different industries in the same supply chain to jointly promote the new product. An example is the joint promotion from the notebook industry and the Centrino platform from Intel.

The cases of Mio strategic alliance can be summarized as following:

1. Mio products entered the home shopping channel through ETV Shopping channel from 2004.
2. Mio168 built-in Greece-Athens City Map for Chinese Taipei Olympic Team during the Olympic Games, alliance partner: Chinese Taipei Olympic Committee.
3. Mail order alliance with major credit card companies like ChinaTrust, CitiBank where the users can select Mio products from the mail order catalogue from 2004.
4. Mio136RS Black Bat Limited edition which was launched when the movie "Batman III Batman Begins" was on the stage.
5. Big size MPV's shuttle equipped with Mio GPS, alliance partner: Volkswagen Taiwan in 2006.
6. Mio Home Delivery Repair promotion, 2006
7. Mio A700 GPS PDA Phone e-Map Upgrade, alliance partner: Chunghwa Telecom in 2006.
8. Mio-TECH cooperates with Mercedes Benzes. The buyer of every model of Mercedes Benzes will get a unit of C710 as bonus in Taiwan. Alliance partner: Mercedes-Benzenes Taiwan, 2006

After successive activities through strategic alliance, Mio is the leading vendor in GPS products in Taiwan with high market share. This study indicates that the high quality product can attract customers but good service is the key to establish the long term relationship with customers. The centralized communication channels, the customized service

and the horizontal alliances for the service center prove the sustainable management of the service center is essential for the business.

IV. CONCLUSION

To successfully implement CRM into the customized service, the enterprise should set the clear strategy, department support and organization operations. Continuous reviews of the quantified service indicators will help to monitor the customer satisfaction and understand the service personnel quality.

This study is taking Mio Technology Limited (Mio-TECH) as an example of case firm to explore the organizational operations of its call center such as applications of communication and computer technologies to automatically handle the large quantity of works, utilize the competitive human resource (HR) in China region to cooperated with Mio-TECH's headquarter in Taiwan to build a good customer relationship service center for worldwide users.

The centralized communication channels, the customized service and the horizontal alliances for the service center prove the sustainable management of the service center is essential for the business. Therefore, the technical enhancement, the customer's satisfaction and the corporate strategy have been significantly communicated and strengthen the customer relationship for the case firm.

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