Title: Technical Assessment in Call Centers

Course: EMGT 610
Term: Winter
Year: 1998
Author(s): L. Inman

Report No: P98011

Abstract: The purpose of this paper is to examine and assess technology assessment and implementation within small to medium sized call centers specialized in highly technical support. The paper also introduces the concept of information circuitry to better understand and illustrate methods of technical diffusion as well as knowledge transfer.

Technical Assessment in Call Centers

L Inman

EMP-P9811

Technical Assessment

in Call Centers

By

Lane Inman

03/28/98

Technology Assessment
Engineering Management 610
Dr. Daim
Individual Paper

Introduction

The purpose of this paper is to examine and assess technology assessment and implementation within small to medium sized call centers specialized in highly technical support. Specifically, the paper was conducted to examine the factors involved with a local customer support center. The paper also introduces the concept of information circuitry to better understand and illustrate methods of technical diffusion as well as knowledge transfer.

Currently there are publications dedicated to support organizations and call centers of various magnitudes. These journals and magazines include Call Center, Service News, ASFM Journal, and less directly Information Week, Unix World, among others. The literature and journals, however, are typically aimed at large scale support centers whose technical depth is shallow and call volume is substantial. These centers such as credit card help lines, utility board hotlines, and some limited PC support deal with short answer issues that share much with manufacturing lines. The overall goal is to reduce variance, increase throughput, and obtain measurable results. This is not to say that these are not the aim of smaller, more highly specialized support centers, however product complexity, as well as technical expertise required to resolve issues or assist customers is often far beyond the scope of the typical "call-center." Effort is placed on individual attention on highly variant processes and even products.

Large call centers typically handle thousands of calls per week, which range in time from 5-10 minutes. Highly technical call centers are much different. There calls range from 15 minutes to days while the work load is in the thousands per month for a much smaller number of customers seven days a week and twenty four hours a day. First overall motivations to technology acquisition will be given as well as a brief explanation of information circuitry. Once these motivations are identified for large-scale call centers, current tools available will be presented as well as the factors that most effect their selection. Finally an example of how a smaller call center must face these issues while bearing in mind their highly talented work force and critical nature of their calls.

Service Centers - Motivation for Change

Customer service centers, or call-centers as they are popularly known in the industry have evolved over the years. Often times originating from the age-old complaint desk, service centers have evolved from obscure backroom boring offices to dynamic high-tech work places with toys even kids would be envious of [7]. Service organizations offer incredible insight to customer buying patterns, deficiencies, needs, and product enhancements to which a company can act upon to increase overall profits. This can be done through a wide variety of actions but they all revolve around the "third wave" of our modern economy, information.. To maintain success, companies must maintain the informational edge, and consider information their asset. In this it has been proposed that service become a knowledge factory [2] where knowledge is made and sold.

The main premise of information transfer is simple. A customer requests information to solve their problems that a service center has access to and thus relays this to the customer. In customer support, this information is often used interactively to determine what the problem is and resolve the customer's problems in as timely fashion as possible, or as the customer is willing to pay. Most decisions within the customer support centers revolve around "customer satisfaction" which is based on the rate at which necessary information can be relayed to the customer to fulfill their needs. Other factors to play a role including agent friendliness, responsiveness, and concern. Technology decisions are often made based on this notion of information flow, or transfer from the organization to the client. In many fields this is known as diffusion of knowledge, or technologies.

Figure 1 - Simple Information Model

The number of channels that a person utilizes will often increase the amount of knowledge that can be relayed between customer and the organization at a surprising and

non-linear rate. For sake of clarity, a simple electric circuit element will be introduced (Fig 1). In this element we have the call center which has a much higher knowledge base on the subject then the customer, in this we have knowledge potential. That which stops the information from flowing directly to the customer is an internal resistance of both the customer and the relayer of the information, as well as the means, which are used to do the transfer. In this case a telephone or manual page.

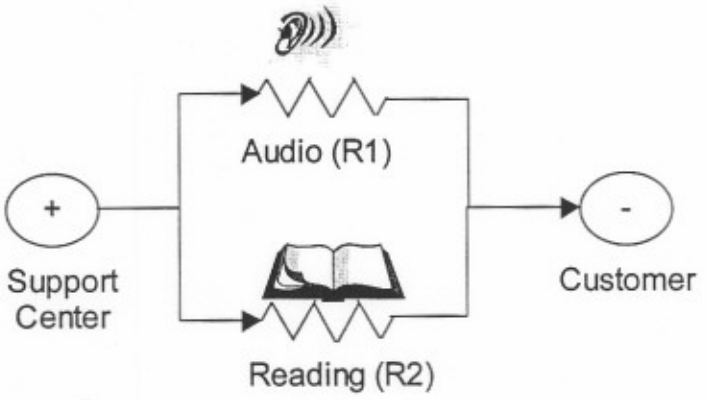

Figure 2 - Parallel Communication Channels

$$R = \frac{R_1 R_2}{R_1 + R_2}$$

Now if a second channel is added to this diagram, the flow of information increases in a non-linear fashion. For this case we will say that follows a basic law of electronics, that of the parallel circuit. Overall informational resistance can be significantly by adding this second channel in parallel as displayed by Equation 1. As can be seen, the rate of information transfer or V/R increases significantly with the implementation of other means of transfer. To explain this further, it is possible to get only so much information out of a means of communication. However if you use them in conjunction, lets say speech and pictures, things become much clearer. The introduction of a third source also improves it significantly without reducing the resistance of the whole significantly. These parallel efforts are highly effective of introducing rapid change without specifically reducing given restrictions of individual abilities. This increased

throughput results in more power and effectiveness of the system at hand in relaying the information to the customers.

Using this analogy in the support center, much of the informational motivation involves increasing the channels and methods to support customers in a timely fashion as well as reducing resistance to the knowledge base that the customers as a whole may have over the call center and the companies marketers. This circuitry also is present between technical experts within call centers and pockets of information, as they need to be dispersed throughout an organization. It is easy to see that as the web becomes more complex, the series nature of resistance causes the largest backlogs, meaning that paralleling these efforts is in a call centers best interest.

Call Center Attributes

There are a number of call center attributes that directly affect call center technological innovation as well as the assessment and acquisition of technology. Following is a list of the major issues which call centers face but is not exhaustive, and aims mostly towards issues that increase the resistance of the flow of information between the customer and the call center. One short list of suggested attributes to base decisions on consists of cost, number of calls, and number of staff. [4]

Call Volume:

The number of calls that come into a call center can sway the choice for technology within a call center significantly. Automated Call Distributors, ACDs, and Internal Voice Routers, IVRs are technologies that simplify and streamline the process of taking customer calls and getting them to the right resources as well as measuring utilization of the resources available.[5]

Call Variance:

The amount of variance between call length and complexity can make the world of difference in tools used. If the range of complexity is substantial then routing may become of utmost importance to ensure that the calls are properly routed.

Call Complexity:

"What is the balance of my checking account? " is a much more simple question to answer than "How should I best distribute my data load on my mainframe to ensure optimum performance?" With this in mind, both resources and the amount of time necessary to relay the proper information will be substantially longer over a telephone.

Knowledge Distribution:

The distribution of knowledge within a call center dictates the need for internal diffusion or call routing within the center. In cases of highly complex systems, an organization may be grouped by specialty and call routing as well as documentation become key factors in the assessment of future technologies. This distribution may contribute to the pivotal role that multiple contributors have within the organization. Highly specialized and skilled labor is a valuable asset for both the call center and their competition.

Urgency:

The importance of the calls as they come in is also a significant issue. There are varying degrees of importance from life threatening to longer response times required. Urgency and time to deliver are often proportional to the amount of time needed to relay the information to the customers. If it is a small amount of information, customers expect a quick response, but it is not always necessary. Typically, it is thought of as more important to answer the question if the result of not answering the question will take more time.

Profitability:

The amount of money that the cost center brings in to the company is a significant factor as well as the amount that they hope to bring in. In highly cost oriented organizations quantification and justification of current resources as well as additional resources are of utmost importance. Although advertising "customer satisfaction" this is the primary concern of most call centers. The more money, the better the call center.

Contributing Factors

Cost of Delivery:

Like most businesses, service centers eye the bottom line. The cost per transaction is a significant driver by call centers to relay information to the users. For short questions, it also does a significant job in reducing the resistance of knowledge flow introduced by the logistics of telephone conversations.

Employee Satisfaction:

In cases where new steps are being required, or procedural change is great, the satisfaction of the employee is very important. Unhappy agents often relay unhappy feelings to customers, resulting in unhappy customers. In addition, smaller more technical support centers may find themselves lacking in technical resources if they continue the trend.

Resource Efficiency:

Whether or not additional resources will be needed to utilize the technology is a key issue that must be considered before the assessment of the technology is undertaken, much like any other situation. Call centers aim to make the most out of their limited resources without requiring more specialized resources to be hired upon implementation of the tools in question.

Proactive vs. Reactive:

Predictive analysis through mapping out calls can help a call center predict what is going to happen within the call center. With this in mind, tools which can assist in reducing overall future overhead may be seriously considered. The tools to address this are typically problem managerial tools that will be discussed in the next sections.

Tools:

There are several types of tools available to the modern call center these tools can be thought of as problem management and problem solving. They serve to track the

monitor the progress of the calls make sure they are appropriately attended to. Problem solving tools concentrate on the problems or information requests at hand and aims to help less skilled individuals or the customers themselves determine what they need to know. [2]

Process Tools:

Call Tracking Systems:

Call tracking systems are the most abundantly used tools to track calls within call centers. Ideally they enable a centralized point to store information about each "trouble ticket" so as to permit the easy relaying of information amongst individuals within the call center. Small call centers may use off the shelf databases such as FoxPro or Microsoft Access, however these databases introduce lag time that can negate their effectiveness after call centers reach a certain size and volume of calls.[6] Call tracking tools also allow means to relay level of support agreements to agents who open the calls and assist customers. In addition they can be used to automate escalation paths or notify management in times where the customer is not getting the desired, or obligatory response.

Automated Call Distributors:

Used by large and small call centers, ACDs are telephone devices built to track time on call, the amount of calls and group individuals. These systems automate the call routing procedure along predetermined guidelines and provide both instantaneous and historical data. An example for larger call centers, reader boards that display the amount of calls on hold or average wait time per customer, to get an overall view. Other uses for these systems also include forecasting of required resources based on past history within the call centers. By providing historical data and information about call loads it is possible to extract the information and project it to the future, use it in conjunction with scheduling and simulation software. [3]

Interactive Voice Response:

IVRs are most commonly known as the push button selection tools. In these customers categorize there call by a matter of menu systems over the telephone and relay

themselves to the necessary branch. Although present in small call centers, these are most prevalent in larger call centers which number in the thousands of calls per day.[5]

Scheduling Software:

In cases where call centers are pressed for resources or wish to make the most of what they have, there are several applications, which allow for the operational issues of problem solving or customer assistance be better achieved.

Problem Solving

Expert Systems:

Long thought of as thinking machines, computers have been looked to solve problems for years. Some of this has resulted in the expert system. Expert systems are typically statically programmed pieces of software, which walk agents through processes to come up with the required information or the correct problem to the solution for the customer. It allows less trained individuals to solve more complex issues, and serves as a method to relay that information to the individual as they assist customers. Tools in this arena include case-based reasoning, decision trees, and neural network software which implements preprogrammed routines to solve problems. Neural nets provide the added ability to apply a limited assessment to those results and come up with its own conclusions as long as they are within the bounds of the program.

This tool is very useful for known data sets, however the building of these systems can be very tedious and time consuming to establish a knowledge base. They lend themselves to more standardized a monotonous procedures which fall to regular categorization and problem solving. They offer a lot of power to relatively inexperienced users and are very useful for banking, PC help desks, and other well traveled paths.

Internet/Intranet Technology:

This is a very broad range of technologies ranging from Internet information pages and call tracking to plain email. Internally, Intranet technology may facilitate the transferal of knowledge to each contributor within an organization. It enables them, much

like external web pages, to give a centralized point of data accumulation for various sources including problem databases, call tracking systems, and other important information. [1] For already technically savvy companies, it also offers a cheap non-proprietary method of disseminating information to users. This in mind, it is no wonder that it is how enterprises will deliver the bulk of their information in the coming users. Proper management of this resource can help control the knowledge gap between customers and competitors. To ensure success, a company must understand the technology and the requirements that implementation will incur. [8]

Email enables rapid and cheap response to individuals and is very cost effective in reducing the volume of calls within call centers. By giving customers more comprehensive documentation and more readily available sources of information the call center can reduce the volume of quick high overhead calls which may come in to the center, which allows them to focus on the more valuable information for their customers. [7]

Case Study - Sequent Computer Systems

The inspiration behind this paper was my personal confusion in the reasoning behind technology implementation within Sequent Computer Systems American Operations Customer Support Center. The previous research was done to understand the various factors that may drive such support centers to their technological decisions. Unfortunately, most literature and documentation offers information for the large call centers.

Sequent Computer Systems, Inc. was the industry growth leader in UNIX servers priced from $100,000 to $1,000,000 in 1997 according to their web page. Their product are primarily used to run large databases such as Oracle and Informix to track financial, manufacturing, and inventory records of several Fortune 100 companies. Competitors include IBM, Sun Microsystems, Compaq, and Digital in a world increasingly revolving around twenty-four hour data centers that handle terabytes of data. Hours of downtime are measured in the tens of thousands of dollars, and issues can be very complex, or quick to solve. This variance may be adapted for through automated systems, however the

overhead associated with simple ACDs and phone systems run in to the 10's of thousands of dollars. Table one illustrates the important factors of the CSC.

As can be seen in table 1, Sequent has a much different demographic than many of the call centers presented within the literature. They are larger than most IT shops, and the urgency of their calls is often much more severe and demanding of technical expertise.

Customers	4000
Calls Per Month	1800-2000
Agents	45
Call Complexity	High
Call Variance	High
Knowledge Distribution	Low
Urgency	High-Low
Profitability	High
Resource Utilization	Moderate
Cost of Delivery	Low
Employee Satisfaction	Moderate-High

Table 1 - Call Center Factors

They currently implement a call tracking system that had been selected primarily because the former one was outdated, and a new interface needed to be chosen. The selection of this tool received a lot of criticism and hurt management's image in the eyes of the user because of the poor planning and assessment of the technology upon implementation. The project team was given a deadline to have everything complete regardless of results three years ago. The result is a completed project with little form due to a rushed job. The tool is functional, and the data is present, but the user interface is very slow and awkward to the engineers who had been spoiled to the old interface. Much of the drive behind the new system was the measuring of resource utilization and internationalization of the database to coincide with the two other regional call centers in Europe and Asia.

Additional Factors:

The CSC of Sequent is in a volatile world, industry wide service center income is plunging due to intense competition and increasing customer expectations. For the service center to survive it must take a new role as an information factory, catering service to its customers and identifying future revenue. [2] Due to this trend it will be increasingly

important to identify new business and increase resource utilization. The low volumes of calls may render the high costs associated with ACDs and advanced telephony systems as a bad idea.

This is a very technology based company, it has extensive internet and intranet capabilities as well as some of the most talented individuals in the industry. The results have been positive. To address these issues a tools team was fabricated to create streamlining programs and centralization of data. Customers are able to access common technical notes and software patches via a web page that had been motivated more by competition than anything else. Instead of adding other channels, the CSC is concentrating on reducing the resistance of its current channels, linking databases, engineering documentation, source code, customer documentation via a clear and easily navigable Intranet.

Future efforts however will have to consider its employee's satisfaction with their job as IT currently averages 9% per anum increases in salary. Additional consideration should also be given to IVR due to the highly diverse nature of the call center, but metrics should be better established to justify the expense.

With all these factors that must be considered, the CSC aims to improve customer response time and increase customer satisfaction in an arena where it currently leads its competition by a comfortable amount. The real weigh-in comes in with integration of current systems and streamlining of knowledge tools to enable better diffusion within the organization so the customer is better off. As with highly variant call center models, it is important for the call center to reduce that variance by empowering the customers to solve their own quick solutions. The result has been implementation of web based help which is offered via the Internet to customers as they see fit. The web allows customers to open up low priority calls through a web interface or email without causing telephone overhead with the call. It also offers the opportunity to download software patches and commonly asked questions that supplement the current product manual sets.

Conclusions

Technology assessment within call center and service organizations is a highly diverse field. It ranges from relatively small organizations to gigantic ones, which employ thousands of people and answer hundreds of thousands of calls. Although the differences between the two organizations are significant, call centers focus on timely relay of information. To do this customer support centers will try to lower information resistance by initiating new communications channels as well as reducing the resistance of present ones. Customers must identify current problem areas in their technology, think ahead, and make wise purchase decisions by preparing for the sales representatives and checking references. [9] The most influential factors in technology assessment involve profit and resource utilization along with customer satisfaction, which is typically measured by service level, the percentage of customers who wait less than a predetermined time. [4] Assessment must be conducted on a case by case basis to ensure that the best fitting technology is located and implemented within the organization. In this case study, it is important to realize the value of individual staff members as well as their utilization and information sharing, for it is only through effective sharing that a cost center can truly defeat its internal and external information resistance.

References

[1] "Info in An Instant," in *Communications News*, vol. 34, 1997, pp. 48-49.

[2] P. W. H. R. Bonsel, "A New Service Management Concept," *AFSM International*, vol. 22, pp. 28-30, 1997 Nov.

[3] J. Fleischer, "Making Sense of ACD Stats," in *Call Center Magazine*, 1998, pp. 98-105.

[4] V. Mehrotra, "Ringing Up Big Business," in *ORMS today*, vol. 24, 1997, pp. 18-24.

[5] A. Ousey, "How IVR Systems Make Call Center Life Easier," in *Call Center Magazine*, 1998, pp. 113-119.

[6] B. B. Read, "Why Customer Information Has Become More Valuable," in *Call Center Magazine*, 1997, pp. 92-96.

[7] B. B. Read, "Banking on Sophisticated Call Centers," in *Call Center Magazine*, vol. 11, 1998, pp. 74-96.

[8] E. B. Stear, "What Business Are You in?" in *Online*, vol. 21, 1997, pp. 83-84.

[9] T. Yianilos, "A guide to evaluating inbound call center management technology," in *Telemarketing-and-Call-Center-Solutions*, vol. 15, 1997, pp. 30.