Case Study #1

Introduction

At Complex Machines¹, a company specializing in document reproduction machines, there are 4,000 customer service and support representatives (CSSR) fielding telephone calls from approximately 22 million customers a year. The several call centers responds to three major areas of customer request: 1) machine service/repair 2) purchasing of machine supplies and 3) inquiries about customer contracts, account status or invoices.

Currently, Complex Machines divides its call center into four separate functional groups: equipment service, supplies marketing, account administration and telemarketing. Each organization has its own 800 number, management structure, information systems and workspaces, but share the same customers. Often a customer call cannot be handled by just one functional group, so a customer is transferred back and forth between departments until his or her problem is resolved. As a result, both customers and customer service representatives are frustrated by this inefficient system.

The Integrated Customer Support (ICS) Initiative is a plan by Complex Machines to increase customer and employee satisfaction by training, giving the tools to and empowering each customer service representative to effectively help a customer in a single call, without “hand-offs” to other departments. Although there will be significant costs associated with starting up the ICS program, the long-term benefits include greater customer loyalty, lower employee turnover rates (currently at 25%), and greater opportunities for telemarketing.

The two major learning challenges involved with implementing an ICS Pilot program are: 1) designing the best learning and operation strategies to implement ICS, and 2) changing the Corporate Training Organization to meet the needs of ICS. The initial pilot is supposed to train fifty workers in fifteen weeks, and the plan must be scaleable to include all 4,000 employees around the US.

Our team addresses the two learning challenges through online courses, job rotation and shadowing, development of a new software information system and interface, introduction of a help desk, changes in the physical work environment, and a significant reorganization of the training functions.

While what we are proposing are massive organizational transformations extending far beyond the purview of the original ICS agenda, we believe our proposal can annually save Complex Machines over $100 million in operations expenditures, and with an ROI of approximately one year. We believe nothing less than the changes proposed here can be effective.

¹ Pseudonym used
Organizational Transition

In order to implement the newly redesigned work system, we propose a hybrid training process that involves initial rapid training seminars, on the job training by shadowing a mentor, and finally transition into a redesigned work environment where all employees have attained general proficiency in all the functional areas.

Currently, within the organization there are four different functional silos, which are billing, service, supplies sales, and telemarketing. It is assumed that the employees who have worked in their specific area for more than 6 months are proficient in their specialty. Therefore, each employee will be trained over a 15-week period in the other three functional areas outside of their specialty.

The training for CSSRs will be in three stages. Each stage will be 5 weeks long for each functional specialty. Every stage will start with an intensive rapid training seminar which will last 1-2 days. The focus of these seminars will be to provide a brief overview of the job specific tasks that the employee will need to master in order to gain proficiency in that functional area. Once they have completed the seminar, the employees will then work in that specialty area with a trained mentor for the remainder of the five weeks. During each week, they will receive additional training to help them understand the general terminology, and technical details of equipment and procedures relevant to the functional area. After completing the five-week seminar/apprenticeship, the employee will then continue to train in the other functional areas.

Overall, the training seminars will work to provide CSSRs with a cognitive understanding of how that particular job function fits into the overall corporate process as well as understanding the job specific tasks of that function. These seminars will be taught and designed by an educational specialist and an employee who has been identified as an expert in the specific functional area being taught. These expert specialists will be identified and trained in all of the other functional areas beforehand and will have worked in the new high performance cross functional groups.

Once the customer representatives have completed training in all functional areas, they will be transitioned to a new work environment where they are arranged in four person cubicles. Each of these cubicles will have four work stations. The work groups will be designed so that there will be one representative who worked in each functional group before being cross trained in all of the areas. This new work environment affords situative support between the four team members. Therefore, the employees can learn from each other as a group.

Steady-State Implementation

We have two components to help customer service representatives do an effective job of helping Complex Machines customers: an integrated database that fosters interaction among the representatives and an online customer service web site. Both will accomplish the main goals of increasing knowledge among representatives and integrating Billing, Service, Sales, and Telemarketing. Both will need a design team to create a system that is user friendly and also ensure that it models the mental model of our representatives.
Servicing Database Organization

There are two databases that the software system will need to access:

- Accounting Database – Customer accounting information.
- Service and Support Database (SSDB) – Technical information needed for solving customer problems.

We assume that the Accounting DB will remain largely as it is, but be integrated into the CSSR online support system described here.

The rest of this section briefly details the organization and content of the SSDB. This database consists of two major pieces:

- Document Repository – On-line documents with servicing and support data.
- Search Engine – Allows quickly locating suitable documents in the repository.

The Document Repository consists of all on-line technical and servicing manuals and other files that describe the company’s products in general, and contains in detail an extensive set of trouble shooting and diagnostic documents on all company equipment. The documents are divided into fairly small and digestible pieces (one page or less in length) so CSSRs can easily scan them for information while on a call with a customer. CSSRs use the search engine to quickly identify and scan documents from the Repository to pick up just the essential bits of information to resolve customer servicing problems. CSSRs are expected to intelligently make use of the SSDB, and of their general machine and equipment knowledge, to diagnose and assist customers with minor equipment problems. They are expected to be able to intelligently determine when a service repair technician will need to be scheduled.

Each equipment-related document will have a set of digital on-line photographs associated with it which give pictures of the given piece of equipment. These photographs display automatically on a second monitor at the CSSR station so that the CSSR always has a ready visual reference of the customer’s equipment. Additionally, the CSSR can mouse upon parts of the photograph to obtain photographs of internal machine views.

Preparation of the Servicing Repository

The document repository will initially be compiled from such sources as the Company currently has (on-line technical and repair manuals and the like). Each of these will likely need to be reworked into many smaller chunks of a page or so in size each so that a CSSR does not need to wade through a large document to find the relevant chapter or section.

Maintenance of the Servicing Repository

As new equipment is introduced, existing equipment modified, new procedures established, and so on, the Servicing and Support Document Repository will need to be updated to reflect these changes. Also, as deficiencies in the repository’s contents are ascertained, supplemental material should be added to improve the solve capability of the CSSR staff. There are two ways this maintenance will be carried out:
Servicing and Support Database Maintenance Department

There is one corporate-wide SSDB Maintenance Department responsible for updating the SSDB with engineering change orders, field upgrade information, revised repair procedures, and so on. They are responsible for the regular on-going changes that occur as a result of changes and improvements in manufacturing and field practice.

SSDB CSSR Support

At each call center site, on a regular basis, small teams of CSSRs will be withdrawn from their regular phone duties to both revise and extend the SSDB. Each such team will work together for a few days to at a week or so to examine the particulars of one or more pieces of Company equipment, write up servicing documents, take photographs, and so on and otherwise provide useful on-line information for their fellow CSSRs (and themselves). Each team will receive a brief training prior to starting their work that will instruct them in the procedures, software, and techniques they need to know to appropriately add new documents to the SSDB Repository. It is hoped that by such a participatory process that CSSRs will gain further insight into both equipment functioning and into the use of the SSDB itself.

Fig 1 - Relationship of the Maintenance Department and the CSSR support process.

On-line CSSR Support Software

Interface of the Software

We propose converting the existing case-based servicing software to a simpler search-engine based solution that relies upon the general machine knowledge of the CSSR for it’s primary effectiveness. The main goal of the interface is to ensure that representatives get the information they need as quickly as possible and to interact with the customer. With that in mind we will need a team of programmers, CSSRs, a GUI designer, and customer advisors. The programmer main responsibility is to display the information from the database to the screen. The customer service representative main responsibility is to provide real life experience to ensure that the system is easy to use, created to their specifications, and to user test the system. The customer main responsibility is to work out the system protocols and give real life examples. The graphical user interface expert’s main responsibility is to ensure that the system is easy to use by maximizing the screen size, developing an intuitive system, etc.
Website

Similarly, the website will need a comparable design team, but the emphasis will be on the customer. Customers will then be asked to user test the website and be the driving force behind the content on the website. Much of the SSDB can be used as source content for the website. This would allow customers to directly access much of the technical information available to CSSRs and troubleshoot their own problems. Every customer who handled their own problems in this way would be a savings for the company.

The following discussion about the software functionality will focus on the customer service representatives’ needs.

Implementation

The software development team will create a two-monitor system for use by the customer service representatives. The first monitor will be used to display database information, and the second monitor to display pictures of a customer’s machine equipment. Below is a description of the design.

Monitor 1

Customer Service Representative Screen 1

This screen is displayed before a customer calls for support (please see Appendix 1). The top of the screen will be search fields to access the database. It will include, Customer ID, Account Number, Serial Number, Model Number, and Other. These were put at the top for fast access to the customer’s information. Below the search fields is a Top Ten Most Commonly Asked Questions by users and a threaded discussion. The Top Ten Most Commonly Asked Questions is intended to provide fast access to the most general questions asked by users. This way a customer representative can see what has been asked before and to have a standard solution for a problem.

On the other side of the screen, is the Threaded Discussion area. This is intended to foster interaction among the representatives by sharing ideas and solutions to common problems. The discussion forums will be broken down by main categories, such as, Sales, Service, Telemarketing, and Billing. This will also include an area for Announcements and other topics that the representatives find useful. We hope that the Threaded Discussion will be one way that information is shared.

Another way that information is shared is the arrangement of the representatives in their cubicles. Four customer representatives will sit in a large-sized cube. Each group of four will include one member from each of the major functional groups.

Customer Service Representative Screen 2

After a representative enters the information of the customer a second screen will appear (please see Appendix 2). This screen will have detailed information on the customer (e.g. name, model, last service, account balance, parts bought, etc.). The top screen will also include a search field for the CSSR to type the problem. As the representative is typing the most solutions will dynamically appear. In addition, the threaded discussion dynamically changes to match the search topic.
Furthermore, at the bottom of the screen will be a listing of potential parts to suggest offering to the customer to purchase. This will include parts related to a mechanical problem that is related to the existing problem, parts that the customer has previously purchased (and to see if they need to reorder), and anything else that is related to the customer’s equipment.

Customer Service Representative Screens for Billing, Parts, Service Calls

Screens 1 and 2 have general information about billing, parts, and creating service calls for the customer. If a customer needs any of these three things, there will be a more specific screen that has more detailed information. We hope that this will ensure that the customer service representative has all of the correct information pieces in front of him/her.

Monitor 2

We are suggesting that all customer service representatives have two monitors. One monitor is for the database screens and the other monitor is for detailed pictures of the customer’s equipment. Once the equipment model is identified the customer service representative will be able to explore the different parts of the copier machine by clicking links to other related pictures. This idea is based on the fact that it is easier to solve a problem if the customer service representative is able to describe the solution to the customer better.

Website

The website will be customer focused and will try to make them proactive in solving their own problems (please see Appendix 3). Although we know that the majority of users will call us, we hope that the web will provide some relief to our call centers. The website will feature every machine’s documentation, known problems and solutions, most commonly asked questions, ask a representative over the Internet, a place to purchase materials/parts/supplies, and more. Much of the content of the SSDB can be repurposed for use on the website. The website was never intended to be a stand-alone solution to helping customers.
ICS Operations Plan

This section discusses the design of the ICS Operations Plan. This plan defines how the Company should structure and re-organize their customer support operations.

Overview
There are currently and will continue to be several large call centers spread around the country taking user calls. Each of these call centers will be similarly organized and operated (see Figure 2).

After the re-organization, each center will have a large staff of CSSRs handling customer calls and two on-site support departments:
- Training - This has three groups:
  - Instructional delivery
  - CSSR Servicing Database Support
  - Help Desk (for CSSR real-time support)
- Administration and support (HR, facilities, etc.)

Figure 2 – Overall division organization under ICS
(Site 1 and 3 are identically organized)

Call Center Site Organization and Operation
The following briefly details the functions of each unit within a call center site.

Call Center Operations
This is the largest department by far at each site. It handles all incoming calls and is the principle consumer of the services provided by the other departments of the organization. Periodically, selected CSSRs are rotated out of their telephone support role and sent to the training department either for additional training or to work for a few days within the
Servicing Database Support department (see below) for the purposes of extending the Servicing and Support database.

Training and Technical Support Organization
Each call center site has a local training and technical support organization responsible for training the site's personnel. This mostly breaks down into an instructional delivery function and for running the CSSR groups, which extend the Servicing database.

Instructional Delivery - Does stand-up and in-situ training and coaching.

Servicing Database Support
Small groups of selected CSSRs are rotated from phone support on a periodic basis for a period of several days to several weeks for special duties. These groups, being approximately half-a-dozen CSSRs in size, are responsible for reviewing and extending the contents of the service and support database. They receive preliminary training in the process they are about to engage upon, and then as a group will be assigned to analyzing one or more pieces of company equipment and generating or extending service and support materials appropriate for inclusion in the SSDB. This process serves two purposes: It upgrades the equipment knowledge of CSSRs, and most importantly, develops a culture of improving the quality of the SSDB by the very people who most need it and benefit from its quality.

Call Center Help Desk
Each call center site has a local help desk that local CSSRs can call upon for immediate support with the CSSR software, product difficulties, or possibly even with difficult customers or ones with unique needs. Help Desk personnel typically are former senior CSSRs with particular wide skills and knowledge. They act as a back-up to issues and problems that go beyond what a typical CSSR can be expected to handle.

The Help Desk is also responsible for generating and distributing such job aides and reference material as seems useful for each CSSR to have immediate access to.

Administration and Support
There is an administrative component at each site to handle such functions as information technology support (computer equipment, network, etc.), Human Resources, and facilities.

Training Operations
There is a single, corporate-wide Training Operations Directorate responsible for design and development of all educational courses and materials. This organization is co-located with one of the call center sites so as to keep the Directorate grounded as closely as possible to what’s happening “on the street.” The co-located site's local training delivery department is subordinated to this Directorate so as to allow tight integration of the curriculum development and delivery process (the subordinated delivery department being the one to test new training materials). The Training Operations Directorate has a number of subordinate groups as given below.
Curriculum Design and Development
The curriculum department is responsible for designing and developing all educational materials related to call center operations. This includes course design and development for new-hires, CSSR technical and soft skills, and other such functions. The department has the following focus in developing training materials for CSSRs:
- Account servicing and updating
- Add-on supply sales
- Teach CSSRs to intelligently use the on-line software to solve customer problems
- Teach CSSRs the general terminology and general understanding of company equipment.

ICS Division Help Desk
This is a help desk accessed mainly by the call center Help Desks. It provides such assistance that the local Help Desks may need and otherwise acts as a very senior technical resource for the whole organization. The individuals in this department also act as consultants and coaches to the rest of the organization on technical matters.

Service and Support Database Maintenance Department
This group maintains and updates the information about supplies, pricing, and so on that CSSRs are expected to promote to customers. They have three databases and/or document repositories that they have to maintain as changes occur: Customer accounting DB, the SSDB, and documents defining the supplies that can be sold to customers as add-on sales. (These last documents are automatically listed on a CSSRs screen as soon as they identify a customer’s particular model).

New Hires and CSSR Upgrade Process
This section describes the training and development that CSSR employees undergo to work with the new system.

Training
The introductory training program for each CSSR provides skills and knowledge in the following major areas:
- Organizational structure and culture
- Customer interaction soft skills.
- Accounting processes and software user interface.
- Product supplies sales (for selling supplies to customers).
- Telemarketing
- Customer equipment support problem solving.

The last category is the one where most training effort and time is spent. The goal of this portion of the training is that CSSRs understand the basic terminology of company products and of the major working parts of the equipment, and the basic troubleshooting process of
equipment malfunctions. With this information, a CSSR should be able to search through the SSDB, locate relevant snippets that address the customer’s problem, and help the customer isolate the problem more narrowly, if not in fact effect an immediate repair. The customer problem solving section of the training covers the following:

- Company product categories and product lines.
- Hardware and product terminology.
- Example equipment disassembly and repair on selected models.
- Using the Service and Support Database and search engine for trouble shooting.

It should be possible to re-purpose portions of the existing field service training materials for the above CSSR training.

Over half of CSSR training time is spent in observing experienced representatives handling calls, and in taking calls with either peer coaching or trainer assisted coaching. The rest of the training period is spent as described above.

**CSSR Work Flow Process**

This section describes the general work flow that a CSSR typically experiences in the course of dealing with customer problems. It describes how a CSSR will typically use the available software tools and organizational support.

In the typical work flow, a CSSR goes through the following steps (though not necessarily in the order given):

1. Receive call and greet customer.
2. Obtain preliminary customer problem definition.
3. Verify account details and currency of account, and update if needed.
4. Address customer concerns:
   - Malfunctioning equipment
   - Account inquiries
   - Supplies
5. Encourage customer to purchase additional supplies as appropriate.
6. Possibly bump calls to the Help Desk.

**Conclusion**

By integrating our services we hope to alleviate the stress put on our customer service representatives and also ease the customers’ frustrations. Our goals were to implement a system to help our representatives become better rounded and at the same time continue to learn on the job. We feel that the training seminars, on the job training, database solutions, and threaded discussions will accomplish these goals.
Appendix 1

*Initial CSSR screen on opening a customer call*

<table>
<thead>
<tr>
<th>Customer #</th>
<th>Account #</th>
<th>Serial #</th>
<th>Model #</th>
<th>Other</th>
</tr>
</thead>
</table>

**Top Ten Most Requested for Specific Model**

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

**Threaded Discussion**

- **Service**
  - ____________
  - ____________

- **Billing**
  - ____________
  - ____________

- **Sales/Parts**
  - ____________
  - ____________

- **Telemarketing**
  - ____________

**Search**  **Collapse All**  **Expand All**

**Free form notes for CSSR to enter during call**
*(customer name, extraneous info, etc.)*
Appendix 2

Screen for Searching SSDB to help customer with servicing problems

<table>
<thead>
<tr>
<th>Customer #</th>
<th>Account #</th>
<th>Serial #</th>
<th>Model #</th>
<th>Other</th>
</tr>
</thead>
</table>

**Search Field**

Results dynamically generated in real time which includes articles, threaded discussion messages, and any other type of solution.

**Customer Information**

Service History

Billing History

Sales/Parts History

Telemarketing History

**Parts/Materials for Customer**

Dynamically generated and will give a list of parts and materials that the customer may need to purchase. This includes a list of previously purchased items and if they will run out anytime soon. For example, they bought 5 ink cartridges and by analyzing the estimated life of ink cartridges we can predict when the customer will need a new supply.

**Top Ten Most Requested**

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

**free form notes for CSSR to enter during call**
Appendix 3

Customer Support Web Site

[Image of the Xerox support website]

**WELCOME TO support**

[Image of a copier]

**Your Copier Information**

- Model: Model T123
- Customer ID: 3C0515D
- Account #: 7195709531
- System Ship Date: 8/6/03

[Button: Certificate]

**Your Copier Warranty**

- Current Status: Under Warranty
- Expiration Date: 8/6/03
- [Link: Details About Your Warranty]

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**Support Tools**

**Fix-It**

- Resolve hardware and software issues with your Xerox system.
  - [Link: Ask Dudley!]
  - [Link: Xerox Knowledge Base]
  - [Link: Documents]
  - [Link: Your System Documentation]
  - [Link: more...]

**Communicate**

- Interact with Xerox technicians or other Xerox customers.
  - [Link: XeroxTalk]
  - [Link: E-Mail Xerox]
  - [Link: TechFax]
  - [Link: more...]

**Customer Services**

- Get non-technical assistance with your order or account.
  - [Link: Order Status]
  - [Link: Support Watch Services]
  - [Link: Spare Parts Ordering]
  - [Link: more...]

**Learn**

- Explore information about your system, industry trends, and technical tips.
  - [Link: Xerox Knowledge Base]
  - [Link: Xerox Documents]
  - [Link: Product Readiness Advisor]

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**Support News & Highlights**

- [Link: Xerox Tips]
  - Hints and tips for your Copier Machine
- [Link: Support Watch Services]
  - Register to have updates about your system(s) sent to you via E-mail.
- [Link: EducateU]
  - Your source for online learning. Xerox owners have access to three course titles at no charge!