ABSTRACT

Using a Corporate Intranet to Convey and Manage Technical Information for Dispersed Audiences at Cincinnati Bell

By

Janet Heath Murphy

This paper reports and reflects on into the internship I performed in order to implement a local telecommunications provider’s use of Intranet and Web technology to deliver technical information to internal audiences. The internship comprised two projects:

• Project 1—Migrating paper content to a Web format, and
• Project 2—Re-designing an existing Intranet site to provide users with an improved user interface.
• Both projects combined principles of technical communication and marketing to overcome cross-functional management and communication issues, and served to train end users in online navigation and content maintenance.

Primary hurdles included the following:

• Internal budget constraints, and
• Internal personnel constraints (increased individual workloads, limitations in Intranet-related skill sets, slow adoption of internal change).

Cincinnati Bell managers recognized their constraints and were open to investigating and implementing creative ways to address pressing—and frustrating—internal documentation issues.

Cincinnati Bell hoped to achieve these goals:

• Faster and more efficient release of information to dispersed audiences,
• Better visual display of technical information, and
• De-centralized content maintenance.

This report includes an overview of my internship, a detailed description of a major internship activity, and an analysis of my process for completing the internship projects.
Using a Corporate Intranet to Convey and Manage Technical Information for Dispersed Audiences at Cincinnati Bell

An Internship

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Department of English

by

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Cincinnati Bell, a local telecommunications provider, agreed to act as my internship sponsor during the period of June 16, 2002 through October 16, 2002. This time frame represents a 16-week period of my normal role at the company.

In my position at Cincinnati Bell, I am a contracted employee. I perform technical communications consulting on a per-project basis. I have enjoyed a long and trusted relationship with Cincinnati Bell: I have been a contracted employee there since 1989, when I accepted a position with a contracting firm that had ongoing software documentation projects at Cincinnati Bell.

In my capacity as a contracted technical communicator, I have worked in nearly all their departments on cross-functional teams responsible for developing new software (e.g., billing-related applications), telephone services (e.g., Voice Mail, Fuse Internet Access), and most recently, migrating internal documents such as user guides and process flows from paper and databases to a Web format on the company Intranet.

At the macro level, Cincinnati Bell is an independent local telephone company that also provides wireless connectivity and Internet access. The company provides telecommunications products and services to residential and business customers in Ohio, Kentucky and Indiana.
For this internship, I worked closely with two departments on two projects:

**Department 1: Network Operations—Finance Group**

The Network Operations—Finance Group is responsible for forecasting and managing the capital costs associated with Cincinnati Bell’s telephone network.

Simply stated, the telephone network comprises physical elements of copper, wire, and electronic parts. Each piece of physical hardware has an associated cost that can presumably be managed by the Network Operations Finance Group. This small group of 16 people uses several proprietary information systems to track the network parts, manage expenses, and reduce capital expenditures by the company.

The people in this particular group are diverse, interesting, and contractor-friendly, which is important because not all work groups are open to having a contractor working among them. Why? Depending on the atmosphere of the workplace, contractors can be perceived as a job-threat to the company’s employees. In comparison to employees, contractors generally are a paid a higher rate [which can be a sore spot among the staff], have a broader and more specialized educational background, have the support of upper management, and ask a lot of questions that company long-timers cannot always answer [or do not want to answer]. The Network Operations group viewed contractors as welcome assistants and professional peers.

The Network Operations group performs back-office support functions for Cincinnati Bell’s customer-facing technicians and installers and are led by
a development-minded director who encourages them to “think out of the box” on cross-functional issues, such as helping other departments understand that equipment parts are a company asset that must be properly inventoried and accounted for at all times. Like most telecom companies today, Cincinnati Bell is struggling with a large debt burden; by improving their record-keeping on new and used inventory, they can improve the corporate bottom line by several million dollars.

In my position as intern, my overt tasks were to review the User Guide for an inventory-tracking application used by technicians in 85 locations throughout the Tri-State area and to migrate the content from a paper-based format to a Web format.

The project goals were to a) reduce distribution time for content changes, b) reduce unnecessary paper, c) improve version control, and d) provide a single, Web-based, repository of the current document.

As a trusted vendor, my covert tasks included acting as a “paid listener” to the application administrator and other Cincinnati Bell employees with whom I work: Frequently, employees view me [and other long-term contractors] as sounding boards for their workplace concerns and frustrations. In return, I receive an interesting glimpse into the inner workings of organizational behavior and politics. I will discuss this aspect of the internship more in Chapter 4.
Department 2: Information Technology ITSC Team

Cincinnati Bell’s Information Technology (IT) department is responsible for developing and maintaining the information systems that enable all aspects of commercial and residential telephone service. See Figure 1 for a high level view.

![High Level Overview of IT Systems](image)

Maintaining the enormous number of systems, records, and projects that are always underway in the IT department requires a library of documentation that can be easily accessed and maintained by the IT staff.

In an effort to store IT documentation in a single, central library, the IT department created a home-grown Intranet site, known as the ITSC (Information Technology Support Center).

The ITSC content includes application information, budget information, project plans, process flows, vendor contact lists, and any other IT system-or project-related information that employees might find useful.
Content is authored by IT project managers and departmental application administrators—there are approximately 100-125 designated authors throughout the company. In reality, however, less than 10 authors actually make the effort to develop content for the site.

This site is administered by a small team of three gatekeepers [two full-time employees and a co-op] collectively known as the ITSC Team. When authors have new or revised content for the site, they post the content to a test server and notify the gatekeepers. Within the next 10 days, the gatekeepers upload the content to the production server, where it is accessible to the end users. See Figure 2 for an illustration of the process.

![Figure 2: ITSC High-Level Content Uploading Process](image-url)
The information is accessible by any Cincinnati Bell employee (approximately 2,000 people), but it is developed with a focus on employees in the IT group (project managers, application administrators, and programmers).

For several months prior to my internship, a sense of frustration had been building between the end users [the authors and readers] and the ITSC Team. Issues centered on the perceived level of ITSC site usability, limited search capabilities on the site, slow turnaround time for site enhancements, and the team’s unfamiliarity with Web browser capabilities. The ITSC Group perceived the end users to be technically weak, demanding, and non-responsive and the end users felt the same way about the ITSC Group. To phrase it in the vernacular, they just couldn’t stand one another.

Users—who were savvy enough to understand the capabilities of Web-enabled documentation, but not technical enough to implement their requirements—expressed frustration with the content-heavy site.

The ITSC Team members were of mediocre technical aptitude but were not savvy enough to understand several things about end-users, including that a) the end-users had been on enough IT projects to quickly identify the technical limitations of the ITSC Team, b) the end-users understood IT project methodology [i.e., using a problem-solving model] and expected the ITSC Team to follow the methodology in some manner, and c) frustrated end-users with access to funding will hire a third party [in this case, me] to redesign the ITSC Web site to meet their needs.
The remainder of this report focuses on the following:

- An overview of my two projects:
  1) Network Operations—Migrating content from a paper-based document to a Web format for the Network Operations group, and
  2) IT—Redesigning the user interface for the ITSC site to improve end-user navigation and retrieval of online documentation.

- A detailed description of the tasks and challenges involved in the Network Operations project of migrating a paper-based user guide over to a Web-based user guide.

- An analysis of how the problem-solving model helped in successfully working through interoffice politics on Project 2, the ITSC project.

- Appendices:
  1) Project Time line,
  2) Before and After Examples of Both Projects,
  3) Example of Sub-Navigation on Project 1, and
  4) A copy of “The Problem-Solving Method”.

About the Organization, continued
Chapter 2
Internship Overview

The mindset of using bound paper manuals to deliver job-related information is heavily embedded in the psyche of seasoned telecommunications workers across the United States. Paper documents provide a visible security blanket in an industry whose employees deal in the invisible: voice and data frequencies carrying unseen conversations from point to point along copper wires and fiber optic lines.

However, with the rise of Intranets, Web-technology, and online documentation, Cincinnati Bell slowly has begun eliminating paper binders from the corporate library. With some exceptions, documentation now resides primarily on servers instead of library shelves. Employees no longer need to stroll down the corridor to their departmental library; they remain at their desks and locate documentation on a shared drive or Intranet site.

This chapter contains an overview of my two projects, both of which were designed to move Cincinnati Bell employees towards user-centered online documentation:

Project 1) Network Operations—Migrating content from a paper-based document to a Web format for the Network Operations group, and

Project 2) IT—Redesigning the user interface for the ITSC site to improve end-user navigation and retrieval of online documentation.
Redesigning the Inventory Tracking Application User Guide

Cincinnati Bell’s Network Operations Finance Group uses a proprietary inventory tracking application to maintain inventory records on a specific piece of telephone system equipment: plug-in switch cards [“plugs” in telecom parlance]. Cincinnati Bell uses a variety of plugs from several manufacturers. The cost of a single plug can be in the hundreds of thousands of dollars. The Network Operation Finance Group is very serious about managing the company’s inventory of plugs—it is easy for them to associate proper management of the plug inventory to an improved corporate bottom line.

Before I began working on this project, the application administrator had developed a comprehensive paper-based user guide for his audience—installers and technicians in 85 locations throughout the Tri-State area. The guide contained an overview of the application and the following procedures:

- How to enter new inventory into the application.
- How to track a piece of inventory as it moved from one field location to another.
- How to return defective inventory to the manufacturer for repair or refund.

Additionally, the application provided reports on the number of plugs in inventory and their associated dollar value.
When Laurie Winkler, my sponsor, hired me to work on this project, she indicated that the technical communications problem was to improve document distribution and version control by eliminating the paper publishing method. By publishing the user guide online, the application administrator would be able to provide more timely and accurate content to the technicians. Laurie and I have a working relationship that dates back about six years and which I describe more fully in Chapter 3.

From the outset of the project, I understood that the user guide would reside within the pre-defined framework of Cincinnati Bell’s official corporate Intranet, which is called Hawkeye. Within the pre-defined framework [sidebar and top bar] of Hawkeye, designated authors are assigned a “section,” and within that section, an author can design free-form content Web pages. See Figure 3 below.

![Hawkeye's Pre-Defined Format](image)

**Figure 3**
Hawkeye’s Pre-Defined Format

When I arrived, the administrator was struggling with trying to keep 100+ end users synchronized with the current paper release of his application documentation (100+ binders of more than 100 pages each).
To help the administrator streamline his content delivery process, I spent about eight weeks, at 40 hours each, on the following tasks:

- (8 hours) Reviewing the existing content for clarity and ease-of-use.
  
  For the most part, the content was well-written. My goal for this task was to identify how the content should be re-engineered for online use.

- (72 hours) Developing a Web page template that would enable end-users to easily find the desired information as well as provide visual continuity among the various procedures. See Figure 4 at right, which shows the general layout of features, headings, and body text on the user guide pages.

- (8 hours) Defining search engine requirements. This task involved working with the Intranet developer, who created a special “exception” process for the existing Intranet search engine. The exception is that my end users would only search the portion of the Intranet that contains these user guide files, rather than searching the entire Intranet. My goal was to provide “targeted and relevant” search results for the end users.
Project 1
Task Overview, continued

(8 hours) Developing a logical file structure (a “tree view”) for storing the .htm files and the .jpg files.

(160 hours) Migrating the content (text and images) into the Hawkeye library that stores the .html and image files. To perform this task, I used copy-and-paste and a combination of editors (Word, Notepad, a home-grown tool provided by Cincinnati Bell, and Corel PhotoPaint).

(40 hours) Editing the content as needed for grammar, cohesiveness, and clarity.

(8 hours) Conducting periodic reviews and tests with the administrator to ensure the working draft was consistent with his expectations.

(8 hours) Making revisions to the project plan along the way to ensure the administrator’s goals were met.

(8 hours) Planning and conducting further review and testing after the document went into production.

(8 hours) Training the application administrator on how to perform updates to the online content.

During the project, the application administrator and I frequently discussed ideas and approaches—our adjoining cubicles made collaboration easy and social—to ensure that progress was being made to his and the sponsor’s [Laurie Winkler] satisfaction.
Project 2
Task Overview

ITSC Web Site Redesign

Each year, Cincinnati Bell’s IT project managers and analysts are pressed by telecommunications mandates and competitive forces to deliver multi-million dollar enhancements to their existing [legacy] systems.

The volume of documentation (project plans, budgets, process flows, timelines, requirements, change control documents, presentations, and more) generated by such projects requires a highly organized, searchable, and maintainable library. To that end, the company’s IT department created their own departmental Intranet site, named “ITSC”, which stands for Information Technology Support Center. The ITSC is a departmental Intranet site, separate and distinct from Hawkeye, the corporate Intranet site.

The ITSC was created by a co-op on a shoestring budget. The co-op’s low-level skills and absence of collaborative end-user requirements were reflected in the site’s design and usability. Although the initial design limped along for well over a year, the document storage and retrieval demands created by large multi-year projects forced the end-users to demand a redesign effort.

My position as a technical communicator on the ITSC Team was created when the end-users hired me to act as liaison between the end-users and the ITSC team, to provide a vision for how a redesign of the site’s user interface could reduce end-user frustration, to work with a graphic designer to develop a user-centered Web format, to implement the new design, and to train the end-users on how to use the new site.
The goals for this project were to improve the site functionality and design so that end users could quickly locate, view, and upload content to the site.

My tasks on the project comprised the following over eight weeks:

- **(40 hours)** Reviewing the existing ITSC site and identifying strengths and weaknesses. For this effort, I met with six representative end-users [out of the 100-125 end users] whose level of expertise ranged from power users to nominal users. I listened to them describe the types of documents they needed to upload to the ITSC, how often, and how this ability affected their job performance. During their daily activities, I sat and observed them using the ITSC to locate information, download files, and attempt to upload content to the site. I listened at length to their frustrations, desires, wants, and needs for an online Web-enabled document storage-and-retrieval application.

  Without fail, the two most common complaints were their inability to locate information on the site and their inability to upload new files to the site.

- **(24 hours)** Developing a vision for a new site that capitalized on achieving the “biggest bang for the buck”—enabling users to locate information faster and easier.
For this task, I sifted through the ITSC Team’s technical rhetoric by listening to them articulate their concerns during preliminary design meetings. These early meetings were my favorite part of the project—they were the point where the involved parties tipped their hand, revealing their “true agenda” on a given project. These meetings gave me a clear indication of the more covert political-social problems that I needed to address to make the project successful. These aspects of the project and how I used the Problem-Solving Model to recognize them, are described more fully in Chapter 4.

- (16 hours) Pulling together an *ad hoc* site development team, which was comprised of a co-op from UC’s Digital Design program, a co-op from Northern Kentucky University’s IT program, and me. At the request of the end-users, the new *ad hoc* team was to minimally include the three-person ITSC Team—their role was reduced to verifying that existing site content and functionality were not lost in the redesign and to prepare them to maintain the redesigned site. They were not pleased with this role. As a result of their displeasure, which was quite vocal, my role grew to include finding ways to ensure that they felt involved from the sidelines. I needed to prepare to take back responsibilities at the end of the project.

Once the team was defined, my role on this portion of the project was to delegate the work among the *ad hoc* team members and to
create a flexible project plan. The end-users and I worked closely with the designer co-op to communicate the design requirements so he could develop a design template that would then be handed off to the IT co-op and me.

Collectively [the end-users, the design co-op, the ITSC Team, and I] worked with the IT co-op to communicate the .asp/database-generated content needs.

I was responsible for creating the static HTML pages and ensuring that progress was made in a timely manner. I was also responsible for “bridge building” with the ITSC Team, a generally grumpy lot who needed to be included in project decisions because they would be responsible for maintaining the new site. [Note: This portion of my internship is covered more fully in Chapter 4.]

- (160 hours) Migrating content from the old site to the new site.
  Specifically, I used Microsoft Word and Notepad to copy-and-paste the old content into the new design. Because of budget constraints, I was not tasked with re-writing the content, portions of which could have used re-writing.

- (40 hours) Testing the new site and reviewing progress with the end-users and the ITSC Team. Because of the contentiousness between the ITSC Team and the ad hoc ITSC Team, the end-users were involved more than usual in the daily progress of the site redesign. As the ad hoc ITSC Team leader, I made a point of
reviewing progress with the end-users on a daily basis, soliciting feedback on the design, the usability, the navigation, and the overall content [static and generated].

While there was not a formal test or review plan, I held brief, frequent, open-ended conversations with users along the lines of “Here’s the progress we made today. Is this what you had in mind? “Do you like this?” “Is this what you expected?” “Is there anything you’d like to see done differently?” This approach helped the end-users articulate their needs and likes and also identified areas of improvement that had not been previously voiced. They talked, I listened.

Less frequently, but at least twice weekly, I spoke with the ITSC Team to make sure they were included in the project progress. While these sessions were never pleasant, the sessions gave the ITSC Team an opportunity to vent their frustrations at being excluded. They talked and took jabs at the ad hoc team and the end-users. I listened. And, on occasion, I jabbed back at them. We were very open with each other.

(40 hours) Developing a plan to make continuous improvements to the new site. This task centered on my ability to transfer myself out of the daily management of site content—I was a contracted hourly
employee and the IT department was budget-sensitive. The end-users identified an administrative person who was qualified to take over some of my tasks, and I created an informal training plan for her.
Chapter 3

Detailed Description of a Major Activity

For both my internship projects, I mapped out the work effort based on the time line in Appendix 1. I performed all activities with close collaboration with my project sponsors—Laurie Winkler in Network Operations and Sue Asher in IT—and my writing mentor, Anna Reising.

Laurie and I have a working relationship that dates back about four years. As my primary sponsor at Cincinnati Bell, Laurie has provided me with an on-site cubicle in her workgroup. Sue and I have worked on IT projects together since I first began at Cincinnati Bell in 1989. I enjoy working with them—their project management style is confident, honest, and professional.

Anna is a well-respected senior technical writer/project manager for Keane, Inc. in Cincinnati. We have known each other professionally and socially for several years and worked together, on occasion, on documentation projects for Cincinnati Bell and other firms. I welcomed her opinion and guidance during our informal project discussions.

This section covers a major activity in Project 1: migrating content from hard copy to Web format for the Network Operations Finance Group.

Upon meeting with the application administrator to determine the scope of this project, I talked with him at length to better understand his existing documentation format, his manual delivery methods, the needs of his audience, and his goals for the project deliverable.
Together, we agreed that the most logical plan for migrating his hard-copy documentation to the Intranet Web site [Hawkeye] would be to define a plan and work through it. To that end, I performed the tasks below.

- **Obtained a current hard copy of the documentation.** The application administrator provided me with a user guide identical to the one distributed to the end users. By having the same information as the audience, I was able to “walk in their shoes” and better grasp how the information was used and how it could be improved.

- **Obtained existing electronic files of text.** The application administrator also provided me with his Word files for each chapter of the binder. He had worked closely with his audience for several years, and his supervisor, Laurie [whom I trust implicitly], had indicated that he had a deep understanding of the audience and their user guide needs. His ability to accurately convey the audience characteristics to me lightened my workload considerably. During the handoff of Word files, he was able to note which chapters were in need of revisions, which chapters were in need of development from scratch, and which chapters were OK as written.

- **Obtained electronic images of graphics.** The application administrator had used a great many screen shots in his documentation, and he was able to provide those images independently from the text content in Word, in .jpg format. This was a tremendous help to me, as it reduced my workload.
- Identified areas where additional graphics could enhance usability.

Portions of the documentation were intended to convey a series of “if-then” statements and related procedures. For example, a technician might need to exchange a defective part from a storage bin in Lakeside Park for a similar part identified as being on-hand in a storage bin in the Dana Avenue Garage [known as a “like for like” exchange]. The inventory management application offered users a series of decision variables; responses dictated which procedures the technicians should follow in handling the exchange.

Figure 5, below, shows the graphic the application administrator and I created to help the end-users determine the proper procedure.

![Diagram](https://via.placeholder.com/150)

**Figure 5**
Like for Like Decision Flow
(”Yes” and “No” paths are hot links to procedures)
- Developed a Web template for the content. Because of my long-term relationship with Cincinnati Bell, I had prior experience with other internal Intranet documentation projects. I used that knowledge to develop a page template that provided consistent and clear navigation for the end users, an ability to search the site, and an ability to print the information without losing information.

Figure 6, below, shows an illustration of the template. It’s important to note that top frame and left-hand navigation frame designs are mandated by Cincinnati Bell. I can only take credit for the “free-form content” area.

![Figure 6 Web Page Template](image-url)
- **Inserted the content into the Web template.** Once the template page was defined, I copied the text out of each Word file and pasted it into the Web file (a .htm file). At this point, I edited the content to improve the voice, clarity, and flow of information. Specifically, there were several instances in the content where headings and styles needed to be applied so that the flow of information was more understandable. See Appendix 2 for a “Before” and “After” picture.

- **Inserted the graphics into the Web file.** Once the text was in place, I then inserted the graphic images that already existed—the screen shots.

- **Developed new graphics as needed.** While inserting the text and the graphics into the Web file, I found that additional graphics were needed and existing graphics needed some updating. I performed those tasks using multiple tools: Visio, Corel PhotoPaint, CoolRuler (for measuring down to the pixel level), and MapEdit (for creating clickable image maps).

  For example, to help users locate glossary terms quickly, I created an image map of the alphabet. See Figure 7 on the next page. I created the image in PhotoPaint, then mapped each letter to the corresponding section of the Glossary file using MapEdit software. When an alphabet letter is “clicked”, the user is hyperlinked to the corresponding section of the glossary file.
Tested the Web page template and migrated the content. Upon completing each Web page, I met with the application administrator to review the navigation, the sample page, the images, the search function, and the print function.

The application administrator was generally pleased with the content migration process and provided helpful suggestions and ideas as the project moved forward. Logistically, it was easy for him to be involved because I was physically located in the cubicle next to him. The office setup created a highly collaborative working environment.

Conducted final testing and review. Once the content migration was complete, the application administrator and I reviewed the entire library of information, noted areas of improvement that should be addressed after my internship, defined the expectations for a final deliverable, and set a release date.
At this point, the application administrator included the application trainer in the review process. The trainer, who was pleased at the overall conversion to Web format, suggested that the standard Web “print” function provided poor results—inconsistent page breaks and margins were a problem.

To meet his needs, I took the extra step of creating Acrobat files of each section and creating a visible “Print Version” link on each section. Creating the Acrobat files was relatively simple—I copied the content from the browser page, pasted the information into a Word file, edited the hypertext links using “search and replace”, and used Acrobat to publish the files in .pdf format. Each Web-to-print retro-fit took approximately 15-20 minutes. There were 17 total files.

- **Post-Project Hand-Off.** Once the project went into production, I spent about four hours training the application administrator on content maintenance so that he could keep the content up to date.
To complete both my projects, I used the problem solving process, which is based on Paul Anderson’s Problem Solving model [see Appendix 4 for a copy]. In chapters 1-3, I discussed the production aspects of my projects; in this chapter I’m changing gears a bit to discuss my approach in handling non-documentation issues, such as politics and skillsets on Project 2, the ITSC project.

My process follows the six steps discussed in this chapter.

1) Define the communications problem. In my approach, defining the problem is largely tackled by listening to the clients “talk through” their frustrations, concerns, and goals. From the start of the ITSC project, content authors and readers made it clear they were frustrated with the three-person ITSC Team and the kludgy design of the ITSC site.

As application administrators, the authors—who place documentation development low on their to-do list—are evaluated, in part, on their ability to provide documentation for internal applications. Between their limited computer skills, writing skills, and the difficult design of the ITSC, the authors believed they were in jeopardy of not meeting management’s expectations. That meant, they might get downgraded on their appraisal, which in turn would have affected their annual bonus. When managers become concerned that their bonuses may be downgraded, they will work hard to arm themselves with
“appraisal ammunition” in order to keep their bonuses. As a result of their fear, I was hired. For readers unfamiliar with management bonuses in the telecommunications industry, bonuses are typically several thousands of dollars—enough to install an in-ground swimming pool, pay cash for a new luxury car, or take a high-end vacation. As a collective unit, one of management’s key goals is to ensure that bonuses are received.

The crux of the matter was that the authors were not excited about creating documentation, the tool they were required to use [the ITSC] was difficult for them, and the people who could make the ITSC easier for the authors [the ITSC Team] were unresponsive and unsympathetic.

At the beginning of the project, my sponsor and my subject matter experts [Sue Asher and a handful of “power user” authors] had indicated that the ITSC Site Administrators could be difficult to work with and were prone to displays of ego. Forewarned was forearmed.

From these early conversations and from my past experiences in working with Sue and her peers, I understood that addressing documentation needs was the overt reasoning for hiring me and justifying my expense as a contractor. The covert reason was that Sue and her peers were familiar with my background in telecom-related technical communications, Web site development, and my diplomacy as a liaison between the end users and developers. They also were aware of my reputation for delivering a professional job and understanding their annual appraisal and bonus goals.
From my perspective and theirs, one of my jobs as a contractor was to make the people who hired me look good to their superiors and peers. If they looked good and received a positive appraisal for their efforts, they were likely to receive a good bonus and I would be likely to be hired back for another project.

In working to define the problem, I listened to their task-related goals and then “peeled back the onion” to obtain an understanding of what were the underlying motivators. On this project, there were multiple motivators: the mandate that application documentation be current and stored on the ITSC Web site, the desire of the authors to obtain a tool they could use more easily, and a desire to have a successful project the authors could include in their annual appraisals.

2) **Design the communications solution.**

Once Sue, her peers, and I were in agreement on the problem—the authors’ need to publish documentation in the ITSC in a less stressful manner, the difficulties of the ITSC design, and the lack of response from the ITSC Team—we were able to collaborate on a solution.

At this point, we had not yet spoken with the ITSC Team, but we had spoken with the graphic designer. Bluntly, we defined the solution without the ITSC Team; we conspired in secret. The ITSC Team had no inkling that the end users were about to revolt. They knew their relationship with the end users was not good, but they completely underestimated how well disgruntled people can become organized once they have a feasible plan of action. As an outsider, it was exciting to see the underdogs take the upper hand.
During this collaboration period, we worked out the mechanics of the new site—the site design, the information flow, the areas where end users would need training, and long-term goals. Additionally, we outlined ways to tackle the roadblocks that we would encounter from the ITSC Team. These roadblocks included:

- Limited Web site design, development, and maintenance skills.
- Arrogance and sarcasm towards the end users.
- Pride in the existing ITSC site design—one member of the ITSC Team had built the site and was best friends with another team member, so they were united in wanting to keep it as it was. At the start of the project, I was sympathetic to the ITSC Team—no one likes to have their efforts cast aside and rebuilt by someone else. As the project continued and I got to know the ITSC Team better, I became disillusioned with them as a development team and as collaborators. My sympathy evaporated.
- Fear of losing their status as ITSC Site Administrators—politically, the ITSC site is a big deal; it was implemented by the IT Vice President and efforts were made by the ITSC Team to ensure that the site provided the data he needed. Although he was happy with the old site, he was supportive of the redesign effort because of the potential for increased productivity.
Sue and her peers worked with the supervisor of the ITSC Team, who reported directly to the IT Vice President. The supervisor did three important things for us at the start of the project: she reviewed the plans, she gave us the approval to re-design the user interface of ITSC Site, and then she went on a six month maternity leave, which was the key to our success. Her absence meant that the ITSC Team was officially leaderless for most of the project. They had an interim supervisor, but the interim supervisor did not fill the void -- the ITSC Team had temporarily lost their primary support person.

3) *Test the solution.* Once we had the ITSC Team’s supervisory approval, we moved forward. By now, the site administrators were getting wind of the changes, but they had not yet discerned the full scope of the project. Sue and I developed a project plan that defined the project according to tasks and roles:

- Re-organization of content [Sue and me].

- Consistent design across all site pages [graphic designer].

- Elimination of pop-up windows and disjointed linking structures [graphic designer and me].
Creation of a professional, commercial look that would encourage end users to use the site [graphic designer].

Answering technical questions and ensuring that the database back-end would display information in the appropriate fields [ITSC Team].

Maintaining the new site [ITSC Team and authors].

Earlier, Sue and her peers had cautioned me about potential difficulty with the two central members of the ITSC Team. The third member, a co-op, was new to the team, but he seemed knowledgeable and likable. He often performed the technical tasks that were beyond the ITSC Team, and he was diplomatic about it. By all accounts, the project would not have succeeded without him.

In physical location, the co-op was located next to the ITSC Team, in a building different from where I resided with the end users. As a fellow co-op, he and I commiserated over the ITSC Team and the authors. We got along very well—we shared the common goals of trying to graduate and needing the project to be successful for our academic purposes.

Knowing that the two central members of the team were likely to be difficult, I used the tasks and roles to create a framework that would minimize their hands-on involvement in the site redesign yet would also allow them to be included in the general team meetings and site reviews. I felt strongly that they needed to feel involved in some
manner, because once the site was launched, they would be responsible for maintaining it.

During this phase, two of the ITSC Team members held true to their reputation. They complained. They pointed fingers. They blatantly poked fun at my approach and the end-users’ computer skills in meetings. It was clear from their attitude that they believed the new site and the \textit{ad hoc} team would fail. Then, one day, something happened.

The turning point came when the site underwent usability testing.

For background, when the ITSC Team’s supervisor went on maternity leave, another supervisor filled her place. In the overall group dynamic, he is Sue’s peer in IT, but he is not known for creative thinking or superior management skills. He was an advocate of the original site and to my knowledge was not aware of the new site design and goals. He worked in close proximity to the ITSC Team; it is my belief that he regularly received earsful, from the two central members, as to the project’s progress. I suspect he commiserated with them in these conversations and encouraged their arrogant ways.

When I was soliciting end users for testing, the two ITSC Team members went out of their way to ensure their supervisor was on the list. They practically rolled out a red carpet as I went into his office. They smirked. They gloated. They were certain he was going to be the kiss of death for the entire project. They were wrong.
Process Analysis, continued

Arrogance and pridefulness were the ITSC Team’s downfall. Thanks to the authors and my sponsor, I had prior knowledge of their ways. They had little prior knowledge of my skills and solid background. Instead of discrediting them—which would have been easy—I highlighted their skills and downplayed their weaknesses. This was an important strategy and one that is often missed by many independent contractors.

When I walked into their supervisor’s office, I was prepared. Before showing him the site, I explained the project history, the frustrations, and the goals. I explained how his people fit into the big plan and how my ad hoc team was looking forward to turning the site over to his ITSC Team.

After giving him the background, we moved on to testing the site, which he had not yet seen. Think about that: he was familiar with the old site, which was designed by a programmer with no graphic design skills. The new site was designed by a Web designer. It was like comparing a Kleenex to a fine tapestry.

I knew that when he took one look at the new site, he would love it. And, he did. By the end of the usability test, the supervisor was not only supportive of the new site, he was on my bandwagon.

At that instant, the ITSC Team knew they had lost a power struggle. From that point forward, the ITSC became more compliant in working with us. Not friendly, enthusiastic, or agreeable, but definitely improved.
This was very satisfying for Sue, the authors, and me. We had taken an unworkable site, applied knowledge management theories, graphic design elements, generated some internal “positive buzz”, and created a tool that was perceived to be an improvement. That combination makes for a healthy appraisal item [referring to step 1 in this process).

4) *Refine the solution.* Once the ITSC Team had their change of attitude, the project rolled along much more smoothly. As the development phase neared completion, I held meetings with them to outline the hand-off process. They liked that.

Defining a hand-off date was important because it helped alleviate their fear of losing the site responsibilities. Often, when a contractor takes on a project, the employees become concerned about losing their job. That was true with the ITSC Team. They had been developing and administering the site for a few years, brow-beating end-users and managers into thinking the site had to be the way it was. The truth was, it was that way because they had reached the limit of their skills. This was not an easy project for them on several levels, the biggest problem being that they didn’t know what they didn’t know.

5) *Implement the solution.* Procedurally, the *ad hoc* team in collaboration with the ITSC Team, implemented a version control software that enabled authors to upload files to the test server. This set up a test environment where the new site was fully tested before being moved to production. This worked out well, because it let the
ITSC Team have the privilege of turning the key and performing the actual roll-out. They liked that.

For the authors, the act of enabling them to upload content helped to empower them. Before, their content had been uploaded as the ITSC Team’s schedule permitted, which usually didn’t agree with the authors’ deadlines. Under the new procedure, the onus is on the author to put the content on the server and email the ITSC Team. In the next scheduled change release, the ITSC Team will place the content in production.

6) Post-production follow-up. Communication barriers remain between the ITSC Team and the authors, but the overall relationship appears better, mainly because the authors have more autonomy over their tasks. Before, they had to trust that the ITSC Team would upload content for them, as the ITSC Team had time. Now, authors format and upload their own content, according to a weekly release schedule. The ITSC Team is able to focus solely on technical issues, rather than content, format, and technical issues. In short, the two factions appear to get along better because they don’t have to interact as much. They still don’t like each other, but the territorial boundaries have shifted enough to make the relationship palatable.

I’d like to summarize this chapter by explaining how important the problem-solving model is for successful, medium-to-high end independent contracting. As a contractor, I professionally cohabitate with clients through their goodwill and mine. When I’m brought onto a project, I respect that the client has taken steps to allocate
dollars to my company that could just as easily be allocated to another firm or kept internally. With this understanding, I use the model to ensure that my clients feel they are receiving value from my involvement.

“Defining the Problem,” in my experience as a contractor, seldom results in defining one single problem. Rather, there are categories of problems that are identified in the context of the overall project: the task problems, the political problems, the social problems, the technical problems, and so on. When I attend meetings early in a project, my “problem-solving radar” is turned on so that I can gain an understanding of all the potential problem areas.

It is these problem-determination analytical skills that sets contractors apart from one another. Some technical communication contractors—“warm body contractors”—are content with performing only the task they are given; nothing more, nothing less. Others—the consulting-level contractors—are more ambitious and better able to see how their efforts can lead to internal change and improvement. I fit into this category.

After the problems are defined and acknowledged, the next critical step for a contractor is “Designing the Solution.” Often, clients will think they have the solution figured out for me, when in actuality they are constrained in their solutions by their enculturated mind set. As a contractor, my value lies in bringing in new ideas that work within the limitations of their existing technical frameworks. Solutions that I offer are not always the most sophisticated or leading edge, but I’m
working within the clients’ budgets and levels of understanding. My goal is to help them spend their money and time in a way that is most comfortable for them, professionally and politically. In return, I give them a service that helps them perform their jobs more efficiently.

Once the problems are defined and the solutions are designed, the remainder of the model falls into place—the solution is tested, fixed, implemented, and followed-up in a rote fashion. But, over the entire life of a given project, I’m always checking for problems that can unexpectedly crop up and de-rail a project. In my tenure at Cincinnati Bell, I’ve worked with several contractors. The ones with the longest staying power are the ones with strong problem-identifying and solution-designing skills.
## Appendix 1

Project Timelines

<table>
<thead>
<tr>
<th>Project 1 Timeline</th>
<th>Project 1: Redesigning the Inventory Manager User Guide</th>
<th>Est. Time</th>
<th>Contingencies</th>
</tr>
</thead>
</table>
| 1 **Review existing content** | Obtain binder from Admin  
Obtain electronic files  
Read the content  
Define areas of development | 8 hours | None |
| 2 **Develop Web page template** | Sketch layout  
Code sample layout in HTML  
Review layout w/Admin | 72 hours | 1 |
| 3 **Define Search Requirements** | Contact IT developer  
Explain search requirements  
Implement IT rules into HTML code | 8 hours | None |
| 4 **Develop File Structure** | Create naming conventions | 8 hours | 1, 5 |
| 5 **Migrating content** | Copy/paste info into CBT Tool  
Apply specs from sample layout  
Incorporate images  
Develop new content as needed  
Discuss issues with Mentor | 160 hours | 2 |
| 6 **Editing content** | Edit for consistent voice  
Edit images/program images  
Discuss with Mentor | 40 hours | 2, 5 |
| 7 **Reviewing progress/Usability** | Meet with App Admin  
Discuss feedback from Trainer  
Discuss with Mentor | 8 hours | 1-6 |
| 8 **Revising the project plan** | Make adjustments as needed | 8 hours | None |
| 9 **Developing test plans** | Create plans that Admin can use | 8 hours | 1-6 |
| 10 **Conduct testing** | App Admin and Trainer test w/users | 8 hours | 1-9 |
| 11 **Training** | Train App Admin on maintenance | 8 hours | 1-10 |
### Project 2: ITSC Site Redesign

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Est. Time</th>
<th>Contingencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Review existing site</td>
<td>40 hours</td>
<td>None</td>
</tr>
<tr>
<td>Become familiar with existing design, interview end users, review materials to be stored on site, consider areas of improvement, discuss issues with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Develop a New Vision</td>
<td>24 hours</td>
<td>1</td>
</tr>
<tr>
<td>Sketch layout of template, define simple/advanced pages, define new framework for content, discuss vision with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Obtain a Team</td>
<td>16 hours</td>
<td>2</td>
</tr>
<tr>
<td>Locate internal graphic designer, locate internal ASP programmer, locate management approval, discuss team issues with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Create Project Plan</td>
<td>8 hours</td>
<td>2, 3</td>
</tr>
<tr>
<td>Develop plan that is highly flexible, discuss plan with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Migrating content</td>
<td>160 hours</td>
<td>4</td>
</tr>
<tr>
<td>Use template from designer, copy and paste information using Word, Notepad, train ASP programmer on template, develop new content as needed, sort content by HTML, ASP, discuss issues with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Test Content/New Design</td>
<td>40 hours</td>
<td>1-5</td>
</tr>
<tr>
<td>Test with End Users, test with ITSC Team, discuss with Mentor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Review Progress/Make Revisions</td>
<td>40 hours</td>
<td>6</td>
</tr>
<tr>
<td>Review site with ITSC Team, review site with Mentor, review site with End Users, revise content, revise navigation, revise ASP functionality</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

39
Appendix 2
Inventory Manager: Before & After

Portion of an Email from App. Admin.

Highlighting indicates my completion of each section.

Handwritten notes indicate new file names for the HTML files and “anchored”
Site Map for New Inventory Manager Intranet Site

Site navigation is cross-referenced against the existing paper document.
**Sample Procedure from the App. Admin.**

IM ADSLWRK (Leased) to New Service (CBT Owned)

Please follow the following IM functions when moving Leased equipment from ADSLWRK to CBT Owned. Remember the orange dot will need to be removed from the boards. Michelle Kilpatrick will need to turn the plugs up in DCPR so they will appear as working units in PICS.

1. Query the inventory at the location and sort by Container
2. Locate the CLEI to be moved:
   ![Inventory Screen](image1.png)
3. From the Tool Bar click on New Service
   ![New Service Screen](image2.png)
4. From CLLI: Scan CLLI (Location) Barcode and CONTAINER
   EVDLOHEY/ADSLWRK
   EVDLOHEY
   BLANK
   SLILVQBAD
   To CLLI: Scan CLLI (Same as from CLLI)
   To Container: N/A
   Equipment: Scan Barcode of the Plug-In
5. CLICK: Next
   ![Next Screen](image3.png)
6. CLICK: Next
7. CLICK: Display Data
   ![Display Data Screen](image4.png)
Sample Procedure from the App. Admin., continued

9. **CLICK**: Send
   IM will return the following Message:

   ![Image of IM message with successful event]

   **Inventory has been reduce by 1 for SL1Y0BA0**

   ![Image of equipment inventory list]

   **PICS Inventory at EV0100HEV(PINV L) will not reflect the units as working until Michelle turns the MTR or Job Up to Service.**
Same Procedure After Being Re-designed for Web

Cincinnati Bell

Overview
Printable Version (PDF)

Use the IM procedures below when moving Leased equipment from ADSLWRK to CBT Owned.

Listen Up! Read this Important Notice!

Leased boards are identified by an orange “dot” sticker. When leased boards are moved to CBT owned, the orange “dot” MUST be removed from the board.

ADSL (Leased) to CBT (Owned)

1. Query the inventory at the location and sort by Container.

2. Locate the CLEI to be moved (see image below).

3. Go to the Toolbar and click on “New Service” (see image below).

4. Go to the “Input Data” tab. Use the image below as your guide and perform the following:
   - Scan From CLEI: Bar-code. (Sample image shows EVDLOHEY)
   - Scan From Container: (Sample image shows ADSLWRK)
   - Scan the To CLEI:
   - To Container field: (leave blank)
   - Go to the Equipment field: Scan bar code of the Plug-in

(Sample image shows "SLT39000AD")
Same Procedure After Being Re-designed for Web, continued

5. Click the "Next" button.

6. When the screen appears, click "Display Data" tab. The following screen will appear:

7. Click the "Send" button to send the data to the server.

8. Inventory Manager will return the following message screens (see image below). When the "RSV PROCESSING COMPLETED! Successful on 1 events" message appears, click "OK".

9. At this point, inventory has been reduce by 1 for SLLV10BAD (see image below).
Appendix 3
Detail of Sub-Navigation

Sub-navigation is illustrated in the red and gray box on the right, entitled “Related Information.”

Each link is an on-page anchor.
Appendix 4
The Problem-Solving Method for Technical & Scientific Communication

I Define Problem
- Specify Purpose [organizational functions, reader’s use, writer’s intention, etc.]
- Analyze Context [constraints, conventions, etc.]
- Analyze Audience

II Design Solution
- Make Preliminary Decisions about Medium, Form, Style, Production, Distribution, etc.
- Gather Information [interview, use printed and computerized sources, etc.]
- Draft Solution [e.g., in print: write rough draft and sketch figures]
- Design Finished Product [e.g., in print: choose typefaces, design layout, etc.]
- Produce Pilot Version or Review Copy

III Test Solution
- Design Procedures for Testing or Review
- Present Pilot Version or Review Copy to Sample of the Audience or Reviewers
- Gather Responses
- Analyze Responses
- Recommend Improvements in the Solution
Problem-Solving Method, continued

IV Implement Solution
- Revise the Solution
- Produce it [print, tape, film, etc.]
- Package Solution
- Deliver Solution

V Evaluate the Solution
- Design an Evaluation Method
- Use the Method
- Analyze Results
- Formulate Recommendations
- Make Changes