



Brøderbund Builds Strong 'Case' for Internal, External Knowledge Sharing

BY SUSAN ELLIOTT

Knowledge management at Brøderbund Software, Inc., has come full circle. The Novato, California-based interactive software developer and publisher delved into knowledge management about six years ago to provide its call center representatives with easy access to accurate product support information. Today others along the product development-and-release cycle use that information to improve the company's products—and that ultimately benefits the reps and customers the managed knowledge originally was designed to serve (Figure 1). Most recently, customers have been welcomed directly into the circle through an Internet initiative that enables them to help themselves to the technical solutions in Brøderbund's knowledge base.

CALLING ON KNOWLEDGE MANAGEMENT

In late 1993 Brøderbund was experiencing significant growth in its product line—including games such as *Myst* and *Riven*, educational software such as *The Active Mind Series* and *Where in the World Is Carmen Sandiego?*, and home productivity software such as *Print Shop* and *Family Tree Maker*—and was hiring additional people with top-notch technical skills to handle the increasing customer inquiries. “The problem was these people didn't have the greatest customer service skills,” relates Jim Wilmott, product support manager. “They could technically fix the problem, but both the customer and the rep would probably end up frustrated.”

To solve this dilemma, Brøderbund purchased Inference's Case-Based Reasoning (CBR) tool to house the technical knowledge customer service reps needed.

EDITOR'S NOTE

Little stays the same in today's fast-paced business world, and the computer software industry has proved to be no exception. Since this case study was written, Brøderbund has become a wholly owned subsidiary of The Learning Company, Inc. This Cambridge, Massachusetts-based software company publishes some of the best-known education, reference, personal productivity, and family entertainment brands in the United States. It also develops, publishes, and distributes its products internationally. More information about The Learning Company may be found at www.learningco.com.

While the structure of Brøderbund is no longer as it is presented here, this case study still tells an educational story of one organization's successful attempts to share its knowledge with customers. The lessons and insights its employees share throughout this article will be of value to any organization striving to use knowledge to provide better customer service. ●

“With this tool we were able to hire customer-centered people who gave excellent service because they now had the knowledge necessary to be technical as well,” Wilmott says.

Despite the company's good intentions, the system initially didn't have the desired effect. When Wilmott came on board in 1994, he discovered that the call center reps were not even using the tool because it wasn't functioning correctly.

With a consultant's help, Brøderbund rebuilt the tool to meet the reps' needs. Soon the call center had access to 4,000 "cases" related to technical support issues and was successfully using the tool to solve its customers' problems.

WHAT IS CASE-BASED REASONING, ANYWAY?

Basically, a case is a set of questions and answers combined with actions. John Walters, online support tools specialist, explains the Case-Based Reasoning process this way: "I could ask you, 'What kind of flowers do you like?' If you said, 'Fresh flowers,' that wouldn't tell me enough, so I'd have to ask you another question. Once I had enough information I could recommend where you could go to get those flowers. But from your first response, I might not be able to."

Case-Based Reasoning, Wilmott elaborates, is "a mathematical process where, in layman's terms, you have a huge piece of the pie and you start cutting pieces of that pie." Each level of questions allows you to eliminate possibilities and move closer to the solution that fits your criteria.

Wilmott offers a sample CBR question-and-answer process: "What product do you have? *I have Myst.*' OK, that's this section of the pie," he says, demonstrating with his hands a substantial slice.

"What platform are you running it on? *Windows 95.*' That's this much pie," he says, downsizing the imaginary slice.

"What's your problem? *I'm getting an error message.*' ... And it continues to get smaller and smaller until you have your resolution."

The first question in each of Brøderbund's cases concerns the product the user has. The second asks which platform the software is running on, and the third inquires about the problem the user is experiencing. After the user answers these questions, the Case-Based Reasoning driver sends the data to the case-point server, which compares that information to the case base and determines the next question to ask.

"By the time you answer product, platform, and problem, you've narrowed it down pretty far and you've probably eliminated 90-something percent of the original cases," Walters says. This makes it easier for the server to pose the appropriate follow-up questions.

"At some point," Walters says, "the collective values of your answers to those questions will reach a threshold score where the case-point server will decide it has an answer for you or that it is relatively sure it doesn't know what to tell you."

THE BASIS FOR THE CASES

Information to populate the case base comes from a variety of sources. One major source is feedback from customers, much of which the technical service staff gathers over the phone. Another primary source is the product support specialists who follow products through their development, including participating in the quality assurance process and evaluating the bugs and other operations issues associated with the product.

Inga Pedersen, senior product support specialist, notes that part of her function in this process is to represent the customer. "While products are in development, we try to look at them and say, 'This is something that will be a call generator,' and make sure it's fixed before the product goes out the door."

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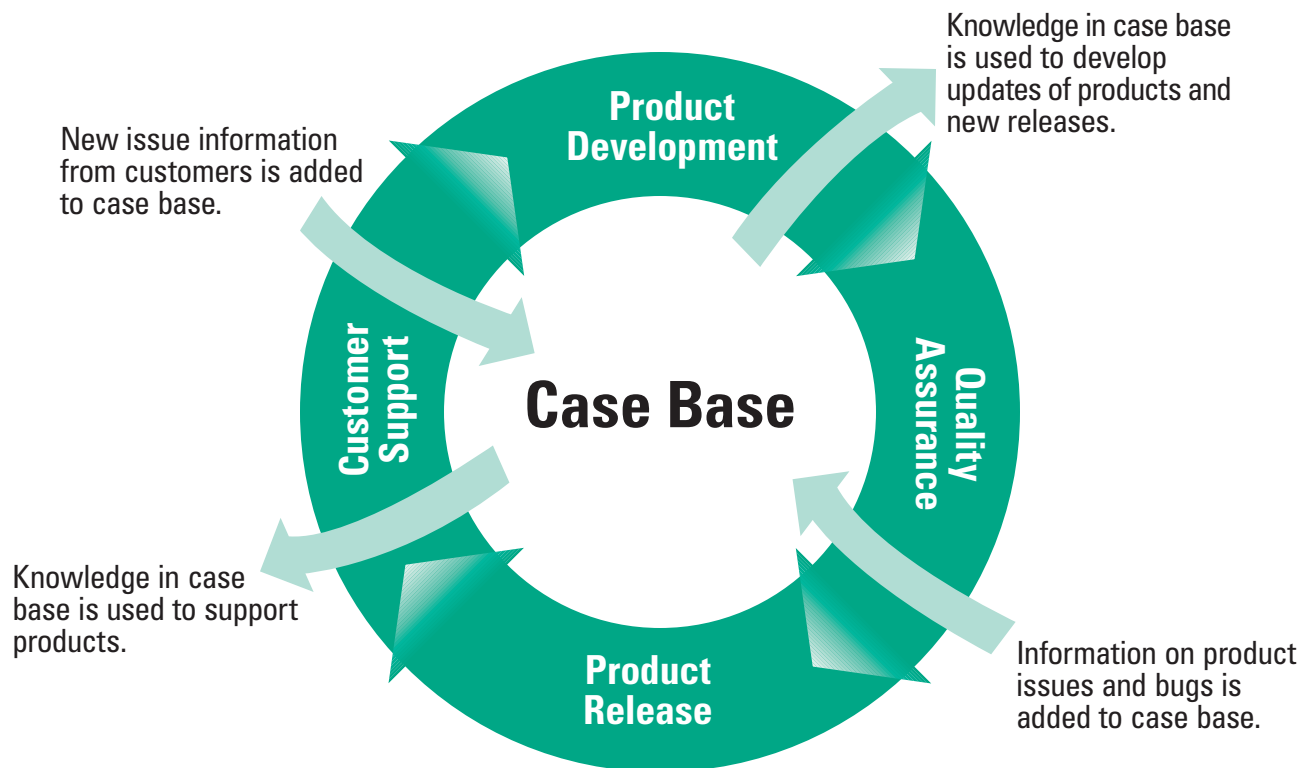


Figure 1: Knowledge Use in the Product Cycle

The Quality Assurance department (QA) notes all the bugs and issues it encounters with a product in a database called Tracker. The product specialists review a report of bugs that are not fixed before release, and they decide which ones to put into the case base.

“We print out hundreds of pages at a time and read through them to try to determine what we think, from our past knowledge, will be a call generator,” Pedersen says. “If there’s something really specific, like an error message—‘doing this causes that’—that’s a gold mine because we know it’s something that definitely can happen, and it goes into the case base. With more general stuff, like ‘this was seen one time and on one system,’ it may not happen all the time, and we have to make a judgment call if that’s something we put into CBR or not.”

“There are a lot of technical support issues that are ‘one-offs,’” agrees Walters. “They’re not going to be consistent enough to be in any knowledge management tool. There are always going to be customers who are really new to using our systems, where the information

they need to use the system may not be out there. But for consistent information for savvy users who know what they’re looking for, the curve goes up.”

The product support specialists write the cases following the product-platform-problem guidelines for construction. They write the versions for the internal knowledge base, and Walters rewords them with more detailed, step-by-step instructions—as customers might need them explained—for the Internet tool. Once the cases are written, the product support specialists decide how they should be categorized in the case base.

“We are the determining factors as to how they’re going to be worded and how we feel a representative on the phone or a customer would look for them in the case base,” says Rick Overmeer, product support specialist. “For instance, I might consider something a video problem, but I’d enter it twice in the case base because it could affect sound at the same time. Customers or reps might look under either one. There is some repetitiveness in the case base because we have to

determine how customers will experience the issue and how it actually will affect them.”

CBR IN ACTION

The internal case base created for the technical service, or call center, reps contains all information on a product they may need to answer a customer’s questions. While the reps are trained on the products and have them installed on their systems, they usually turn to the internal CBR tool for the information they use to help customers problem-solve. “If they didn’t have that data-

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**JIM WILMOTT,
PRODUCT SUPPORT MANAGER**

base,” notes Cyndi Wadsworth, support tools specialist and manager of the internal case base, “we would have to triple our training efforts—train them for weeks and weeks on the history of the product.”

Since the reps were so easily finding the knowledge they needed in the internal case base, Brøderbund decided the next logical step was giving customers direct access to similar information, so they could help themselves.

“We felt we had taken a big hit [in technical service] at Christmas in 1994,” Wilmott says, “and we were looking for a way to offset that. Right about that time was the beginning of Internet fever, and we decided to call Inference to see if we could put [the CBR tool] on the Internet.”

The two organizations reached an agreement, and Brøderbund put case bases for two products, Myst and Print Shop, on the Internet by Christmas 1995. After expe-

riencing initial success, Brøderbund has continued to add this service for more of its products. Now customers have access to support 24 hours a day, seven days a week—and without limitations to how many people can receive assistance at one time.

While the Internet is not a plausible solution for customers who have unique problems, Walters says, it indirectly helps even those who have to call the technical service reps for help. “If we just helped 25 people through the Web,” he says, “then all of them aren’t on the phone or e-mailing, so you can get through to the reps even faster. And if reps learn of a common problem that’s occurring, we then can take the solution to that and put it out on the Web. So it just keeps speeding things up to the point where pretty soon we’re able to get more information out there faster because we have information out there in the first place.”

Walters emphasizes, however, that putting the system out there isn’t enough—you have to let customers know it’s available. “We’ve made sure we’ve mentioned it more prominently in product documentation, for example,” he says. “We’ve also tried to promote the site by being listed on the Internet, like on a list of technical support sites, and we try to make sure we’re listed on the search engine. Also, we win awards occasionally, and that seems to help spread the word that it’s out there.”

EXPANDING KNOWLEDGE MANAGEMENT INTERNALLY

The group of six employees responsible for knowledge management at Brøderbund has seen its initiative grow from assisting only the call center to enriching most of the company’s functions.

“It started out as a support function,” Wilmott notes, “but we no longer just provide a service to the call center or the customer; we’re providing a service to the entire company. For instance, when programmers and people on a project team move on to new projects, where do people go to get knowledge about that process? It’s located right here. Suddenly the company goes, ‘Wow. This isn’t just support anymore. It’s knowledge for the whole company.’”

The New Product Development group depends on the company's knowledge to determine what the call generators are, which can help improve each new and upgraded product as well as pinpoint which bugs are worth fixing. That information currently is shared through people, but Brøderbund is considering implementing a call tracking system to streamline the process.

"With a sophisticated system in place, you would be able to put a dollar amount on each bug," Wadsworth says. "New Product Development might think, 'This is a show-stopper. We've really got to fix this bug.' But if you do an analysis, you might find out it costs x amount of dollars, but this guy over here, which you don't really perceive as a problem, is your real generator, and it's costing back against the product."

Wadsworth currently employs a tool called Tool Book, a software developer's kit, to share product information with Brøderbund's salespeople. "I use that to maintain all of the sales information people need—sales sheets, current offers, facts and information about the product, and its cross-referencing with other products," she says.

No salesperson can keep track of all there is to know about a product, so these Tool Books are their lifeline to all that information. "For instance," notes Wilmott, "the Family Tree Maker genealogy software has hundreds of archives—you can get an archive CD for the marriage records in the 1600s in the state of Virginia.

"There's no way for the average sales rep to keep that knowledge up here," he says, tapping his head, "so this is a form of knowledge management for them."

KEEPING THE CUSTOMERS HAPPY

Customers have embraced Brøderbund's attempts to serve them better through knowledge sharing, but that hasn't kept them from asking for more.

"The customer is only going to be satisfied for a little while," Wilmott says. "You employ a new technology, it works right, it does what it's supposed to do. But the customer is only going to think it's great for a few months. Then they're going to expect something more.

EXPERT INSIGHTS: ALEXANDRIA WOMACK

BENCHMARKING SPECIALIST, APQC

Perhaps the most interesting thing about knowledge management at Brøderbund is how the company defines it. As we learned during our site visit to Brøderbund, a best-practice partner in APQC's recent study on sharing knowledge with customers, the company views knowledge management as a means to problem resolution. This pragmatic approach to a complex topic enabled Brøderbund to begin its initiative on a small scale, with a certain audience in mind. With the immediate success of the initiative, the company quickly saw the full potential of knowledge management and capitalized on it.

Although the use of Case-Based Reasoning proved to be a smart move for the company, getting support for the initiative was somewhat of a challenge. Because the idea developed from the grassroots level rather than the executive level, the small knowledge management team had to justify many of its planned actions, including placing information about product bugs where the public—and competitors—could easily access it.

Next, the group had to justify the resources and expense the project required. As with most initiatives undertaken without a senior-level champion, this required the calculation of return on investment, which proves to be a struggle for many in the knowledge management arena.

After accomplishing all this, the group was able to concentrate on providing its customers with excellent technical service, and in the process it encountered the surprise benefits of building brand equity and obtaining customer feedback for product development and redesign.

That customer input is shared through the case base as well as through an internal companywide bulletin board forum, which often includes a written translation of what the customer said about a product and how it could be improved. This forum is updated once a week, and historical postings are not purged.

CONTINUED ON BACK

BRØDERBUND • CHALLENGES ENCOUNTERED AND LESSONS LEARNED

- **Maintain regular communication with everyone who contributes knowledge.** “I maintain a case base that has roughly 8,000 cases in it and sales information on 200 or 300 products,” Wadsworth comments. “I can’t spend my day calling up different departments in the company to ask if they have any information that needs to be updated. I need to have liaisons from other departments who call me and say, ‘We want our customers to know about this new stuff.’ They need to feed it.”
- **Sharing information with internal and external audiences brings semantic issues into the mix.** “With any knowledge management effort,” Wilmott says, “the key is knowing who your audience is. I look at this as we have two separate audiences. We have an internally trained support staff, and then we have the customer out there. I don’t expect the customer to be trained, so we have to build case bases that they find easy to understand and use. The internal site is very sanitized, and you have to know a little bit about the systems to use it. The Web site is very intuitive; it’s based on a lot of graphical clicking, so even a young kid could solve their problem on the Internet.”
- **Know what technology your audience is using.** “When we first put the Gizmotapper up, we made it graphic intensive,” Wilmott relates. “It was beautiful on the 2.1 line, but if you were on the 9.6 modem, which was the modem of choice back then, it took forever. So we had to re-create it to meet the technology needs of our users.”
- **Build your cases—or categorize your knowledge—within strict structural guidelines, or their purpose will be defeated.** “We had to overhaul the CBR after three years because nobody was following a consistent style,” Wadsworth reports. “From a technical standpoint, people were building their case bases with different parameter settings, so it became like a soup of knowledge, and nobody could find anything.”
- **Keeping the data or knowledge up to date is a consistent challenge—but it must be done.** “I remember one time someone proposed making a Tool Book with all the latest rebate offers in it,” Wadsworth says. “And someone set out to do that. Well, it turns out that rebate offers change every four or five days, and they never designated anyone to keep that information flowing and up to date. So it became a totally outdated tool very quickly.”
- **Be sure to explore all the ways a knowledge-sharing initiative can help your organization.** “We’ve found we can help other departments in the company,” Walters says. “For example, with the auto-response e-mail system, if our customers were interested in learning about upgrades at the same time that they were getting technical support information, we can easily arrange to have that sent to them simultaneously.
“You can start this out on a smaller scale to have the most immediate impact on your company, but then you can start to explore all the different ways you can use it.” ●

An example is when we put out the Gizmotapper—we got rave reviews for a while. Then we started getting suggestions like, ‘Why can’t you respond to my e-mails faster? Why can’t you have patches [to updates] available?’”

One service Brøderbund created as a result is an e-mail option for customers whose Gizmotapper searches are not successfully resolved. A department initially was created to handle the e-mails, but the volume quickly became unmanageable. “The e-mail service started to degrade because we didn’t have enough people to answer the e-mails in a timely manner,” Wilmott says.

Now Brøderbund replies to its customers through Select Response, an automated e-mail system from Aptex. The system looks for key words in the e-mail and searches Brøderbund’s databases for valid responses to send.

Another relatively new customer offering is a hints hot line, based on knowledge mined from Brøderbund’s technical support employees who developed expertise by playing the company’s games. “Hints and things of that nature don’t fall into a diagnostic search engine very well,” notes Wilmott. “Not to mention the fact that they cost the company money and they take away resources that could be helping a customer who’s actually having a problem. So we migrated the hints out to a 900 service, and now we’re making some revenue on that as well as getting the information to our customers.”

SUCCEEDING BUT STILL STRIVING

On an anecdotal basis, success of the case base is measured largely through user feedback. “I get e-mails directly from the customers that provide feedback about the system,” Walters says. “On every page [of the case base] it says send your suggestions and feedback. And anyone who sends an e-mail gets an answer that says if you have comments about this system, send them separately, so I know where they came from.”

For more specific figures, Wilmott looks for both internally and externally generated measures of success (Figure 2).

“Internally I can say we’ve shaved some time off phone calls and we’re hiring more customer-service-

KNOWLEDGE MANAGEMENT—THE BOTTOM LINE

- During the 1997 holiday season, more than 70 percent of customer contacts happened through online methods first.
- An Internet hit on the success page is a cost avoidance of \$8–\$10 (the cost of a technical support call).
- An e-mail response, which costs \$2, shows a similar savings.
- Brøderbund estimates the Internet tool has provided customers with \$11 million of service since May 1996, when the company began tracking Web page hits.

Figure 2

oriented people,” he says. “But to really knock off money, we look at the click-through from the intro to the search engine all the way through to a successful conclusion, a failed conclusion, or what’s called a timeout—when a customer quits a search for a minute or two and the search automatically ends. Success means there’s a 90 percent chance, by the questions that you’ve answered, that this is the solution to your problem. Failure is simply ‘we didn’t come up with anything.’”

“If you discard the timeouts, we’re running at about a 50 percent success rate,” Wilmott reports. “And when you look at the cost of a phone call and how many calls we resolve by using the Internet, it becomes a tremendous argument for the tool.”

Because of the availability of solutions on the Internet, Brøderbund’s call center call volume has decreased consistently in recent years. While it used to grow an average of 20 percent a year, Wilmott says, it’s now dropping an average of 20 percent annually.

“The fact of the matter is we usually take on so much traffic that we probably would not be able to take all those calls with our current staff,” notes Walters. “So it’s really good that we have this system. Instead of these

Brøderbund

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people getting answers, a lot of them would be on hold or getting busy signals.”

Brøderbund believes that sharing its technical support knowledge with customers for free, whether through the Internet or customer service representative, makes good business sense. “Part of the reason for that, and this is generally an industry norm, is that there’s no such thing as bug-free software,” Wilmott says. “To offset that, support is generally free.

“But support is very expensive,” he adds. “It sometimes costs millions of dollars to support the software. So if we can effectively support the software smarter, without costing that much money, it is a good thing.” ●

EXPERT INSIGHTS: ALEXANDRIA WOMACK

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Overall, Brøderbund has done an excellent job of capturing its internal knowledge, as well as customer knowledge, and integrating it into its internal and external case bases. In a culture that typically does not embrace change, the knowledge management group has successfully taken an initiative designed to help a specific segment of users and expanded it to the benefit of the entire organization. ●

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