Knowledgebase Integration with a 24-hour Help Desk

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ABSTRACT

The University of Pittsburgh's Computing Services and Systems Development organization is focused on the needs of the faculty and student population, totaling nearly 40,000 users. Computing Services and Systems Development has operated the Help Desk call center 24 hours per day, 7 days per week for nearly two years. Concurrent with the establishment of the 24 hour Help Desk was an effort to create an online information resource that would serve as a repository of institutional-specific knowledge.

During the past two years, IT resources have been centralized and expanded to provide customers with a single Web site from which they will obtain all IT information and software support tools. These include an enhanced version of the knowledge base currently offered to the University community, integrated Help Desk support tools allowing customers to create and view the status of support requests, and the provision of automated system tools.

Knowledge base support resources are regularly updated and maintained. Such resources, while designed for customer use, will also be used by IT support staff, including the Help Desk Analysts. The conversion to online technical support resources through the knowledge base will improve customer service and eventually result in the resolution of basic support requests without the involvement of the Help Desk staff.

The presentation will detail the experiences and processes that the Computing Services and Systems Development organization encountered during the planning, justification, integration, implementation, and growth of the University of Pittsburgh's knowledge base. Topics such as the work flow, conversion of existing documentation, and training will be included. Detailed statistics and graphs will be used throughout the presentation.

The presenters will report on the successes and failures of the

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project from its inception in early 1998, through recent changes during 2000. Future plans for the Computing Services and Systems Development knowledge base will complete the presentation.

Keywords

Knowledge base, call center, 24 hour Help Desk, ServiceWare

1. OVERVIEW OF UNIVERSITY'S IT ENVIRONMENT

The University of Pittsburgh is a five-campus Research I institution, with more than 12 schools and interdisciplinary programs. The student population is provided with a robust networking environment and numerous services that support their academic pursuits. In addition to public computing devices (more than 1800 seats) and residential network attachments (6,000 Ethernet ports), the Microsoft Campus Software Program provides every student with software including Office 2000 for Windows, Office 98 for Macintosh, FrontPage 2000 for Windows, Visual Studio 6.0 including Visual Basic, C++, FoxPro and J++. On-line courses and course material are well established, with nearly 1000 courses available through the CourseInfo environment. The University Library System has implemented the Endeavor Voyager solution for library management, providing continuous access to electronic journals, databases and other library resources. The University's administrative computing environment is Oracle based, with the Financials segment in place since 1997 and implementation of the HR component scheduled for late 2000. Student information and registration systems are from SCT (ISIS). With 32,000 students, more than 2,500 faculty and 5,500 staff, the total number of Network Authorization Accounts exceeds 50,000.

2. CSSD HELP DESK HISTORY

In April 1996, Computing and Information Services (CIS), implemented a centralized Help Desk to address customer dissatisfaction and confusion. The goal of a centralized Help Desk is to improve customer service by establishing a single point of contact, a virtual front door, for information technology services provided by our group.

Throughout 1996 the Help Desk became an established entity within CIS. By 1997 we were fully operational, staffing 7 Full

Time employees (5 technical analysts, 1 dispatcher and 1 coordinator) and supporting almost 40,000 users. Hours of operation were Monday through Friday, 8:30 AM to 5:00 PM. As the Help Desk service matured, so did the needs of our customers. The greatest area of increased demand was for support services beyond normal business hours.

In August 1998 the Help Desk began the evolutionary process by moving to a 24 hours per day, 7 days per week operation. Since that time the computing support units have gone through additional growing pains, including an organization restructuring that split CIS into two equal, but separate parts called Computing Services and Systems Development (CSSD) and Network Services (NS). Although the Help Desk works equally with each group, it is now organized within the new structure of Computing Services and Systems Development.

As the Help Desk service grew from limit to 24 hour service, CSSD's leadership recognized the need to capture and recycle information and solutions used to support the University user community. A review of existing tools led to an agreement with ServiceWare, a commercial provider of knowlegebase tools. The knowledge base was developed to provide a self-support tool for members of the University community and currently includes solutions to common problems for most of the popular software packages. Additions to the knowledge base are made on a continuous basis for general software packages and services that are University-specific. Students, faculty or staff who are interested in resolving computing problems without the assistance of the Help Desk can utilize this searchable Web-based tool.

3. RATIONALE FOR LEVERAGING KNOWLEDGE

3.1. Capturing the Body of Knowledge

As Computing Services and Systems Development endeavored to better support students and faculty, it became clear that in addition to the twenty-four hour Help Desk, a method was needed to provide support to individuals who are interested in seeking answers to questions themselves. Additionally, it was clear that many problems are common and resolved repeatedly. There was a need to capture the resolution to problems and answers to common questions and make them available to Help Desk Analysts as well as the general University community. Providing this information online would resolve a number of issues. It would provide a way to accumulate answers to questions and resolutions to problems. Help Desk Analysts would be able to quickly address previously solved problems without duplicating effort. Students, faculty and staff would have the option of finding answers to questions and resolutions to problems without calling the Help Desk.

3.2. Accessibility and Content

Data is contained in numerous locations and knowledge is spread throughout the organization. Experts in various technologies are

called upon to resolve and document solutions for the more complicated user problems. Help Desk Analysts were expected to review resolved problems and learn how to resolve future problems from the information contained in the solution field. This works better in theory than in practice. With nearly 150,000 tickets in the Help Desk database at any given time, it is unrealistic to assume that an analyst will be able to review and retain the knowledge for future problem resolution.

Solutions to problems that are recorded in the Help Desk database vary in content. While some analysts will provide extensive detail, most will complete the solution field with cursory comments about resolving the issue to the customer's satisfaction. This proves to be of little use for the Help Desk analyst attempting to solve the same or similar problem in the future.

Although an attempt was being made to capture the knowledge of the individuals resolving customer problems, there were significant impediments to shaping this information into a useful form. There was a need to capture this knowledge in a manner that provided ease of access and content consistency.

A knowledge base addresses the issues of content and accessibility. The purpose of a knowledge base, as it relates to the Help Desk, is to capture the knowledge of critical support personnel, compile it in a manner that is easily understood and accessible to most users. The anticipated outcome when investing in this solution is to eliminate the labor-intensive, repetitive nature of resolving the same problem multiple times. The compilation of information in an easily accessible format will support training for Help Desk staff, enabling them to quickly resolve calls. A knowledge base also provides a method for students, faculty and staff to quickly and effectively utilize this information to resolve problems independently.

3.3. Knowledge base

The principle goal for the implementation the knowledge base was to retain and distribute existing knowledge for use by Computing Services and Systems Development staff and the University community. The knowledge base serves as a repository to capture and reuse existing knowledge. This helps to create an environment where solutions to previously solved problems can be quickly and easily found. A knowledge base helps to transform the current structure where each incident is handled as a new problem.

ServiceWare's Knowledge Management Software is compatible with Remedy, the Help Desk call tracking system at the University of Pittsburgh. In early 1998 ServiceWare and Remedy announced a partnership that will ensure even tighter integration between the two products.

Knowledge Management Software provides a framework for the creation of the knowledge base. Because of the integration with Remedy, it assists in capturing information from existing Help tickets. It provides a framework for submitting new knowledge created by staff and organizing it into logical categories using a decision tree format. Knowledge Management Software has allowed Computing Services and Systems Development to add

features such as hypertext links and hypermedia to its knowledge base environment.

The viewer available with the product provides indexing and searching capabilities and advanced features such as diagnostics. No special hardware or software is needed. The knowledge is delivered using a standard HTML browser.

ServiceWare's Knowledge Management Software and Desktop Suite Knowledge Pak were selected for implementation at the University of Pittsburgh. The benefits include:

- 1. Improved consistency and accuracy of responses to Help Desk calls.
- 2. Improved quality of support by reducing the amount of time required to research problems.
- 3. Reduced average call length
- 4. Delivery of tools for end-users to search the knowledge base and resolve problems independently
- 5. Reduced training costs for new Help Desk Analysts

3.4. Monitoring and Reporting

Continued monitoring and reporting has been done to ensure that the knowledge base is meeting the information technology needs of the University community. Computing Services and Systems Development staff use of the knowledge base is monitored, as well as use by students, faculty and staff. Customer satisfaction feedback fields are also used with the knowledge base.

3.5. Industry Data and Other Critical Factors

Knowledge management is defined as a management discipline for identifying, capturing, enhancing, sharing and managing a firm's intellectual capital.

A recent *InformationWeek* Research Survey of 200 IT executives indicated that 94% view knowledge management as "very strategic" to business or IT processes. Those same individuals ranked behavior modification and organizational culture as the greatest barrier to implementing knowledge management (60%). On average, companies capture only about 45% of their intellectual capital, according to the survey. Also, only 36% of companies have formal policies for sharing knowledge assets--and even fewer have formal policies for capturing such assets.

Another study of organizational knowledge found that nearly 50% resides in the individual and is largely unavailable to others in the organization.

3.6. Supporting a Knowledge Base

The following activities are critical to implementing and supporting a knowledge base tool:

- Constant updating of knowledge
- Establish a taxonomy
- Data should be self service
- Management support and buy-in
- Foster an environment and culture that encourages information sharing
- Provide incentives for documentation and knowledge sharing
- Well-established communication methods
- Ongoing training program for all contributors and users to the knowledge base

4. CURRENT IMPLEMENTATION

4.1. CSSD's Knowledge Base

A knowledge base was developed to provide a self-support tool for members of the University community. The knowledge base currently includes solutions to common problems for most of the popular software packages. Information is continually added for general software packages and services that are Universityspecific. Additions to the knowledge base are made on a continuous basis. Students, faculty or staff who are interested in resolving computing problems without the assistance of the Help Desk can utilize this searchable Web-based tool.

5. EVOLUTION OF THE TECHNOLOGY HELP DESK

5.1. Technology Help Desk

The Help Desk will evolve into the primary baseline computing support service at the University, providing a wider variety and higher level of staff expertise at initial contact. IT support organization staff members with extensive consulting and technical experience will become part of the Technology Help Desk service and will assist front-line Help Desk consultants to resolve most problems or requests immediately. In addition, other senior IT organization technical staff members will rotate through shifts on the Technology Help Desk to assist with more complicated questions and requests. Such rotations will ideally coincide with service introductions, expansions, or changes, providing additional expertise in areas expected to generate greater call volumes.

The increased role of the Technology Help Desk will include the scheduling of on-site visits and billing responsibilities and provide a seamless transaction to a caller with their initial support request. This consolidation will further streamline computing support services and provide greater customer service to the

University community. The integration of the Remedy Action Request System (ARS) call management software with the Automatic Call Distribution (ACD) telephone system will also streamline processes, and will lower delays in assisting callers.

The benefits of such an evolution are numerous. Callers will have a greater percentage of their initial support requests resolved immediately. Time-consuming call-back delays will be significantly reduced. The availability of more senior technical analysts will ensure fewer instances of incorrect information being given to customers.

The consolidation of divergent support personnel into a unified Technology Help Desk will provide greater internal development and cross-training opportunities for staff members. These opportunities will lead to a greater centralized pool of knowledge from which to draw. This collective knowledge can be proactively applied toward self-support tools and new or existing services. The tighter integration of the Technology Help Desk with other computing services, such as Residential Networking (ResNet), and the Contract Support program, greatly reduces the duplication of services and increases the efficiency of the IT support organization.

The Telecommunications call center will be integrated into the Technology Help Desk. Requests for network ports, status of port requests, and all telephone installation, repair and service orders will be handled by the Technology Help Desk.

Decentralized IT activities on the campus should maintain routine communication with the Technology Help Desk. This process of information sharing will ensure that the University user community, through the Technology Help Desk, has access to the decentralized IT efforts. For example, if a departmental Web site is not functioning, the Technology Help Desk staff will alert the department to the problem and keep users informed of the status of the service.

5.2. Self support tools and programs

The provision of IT support via personalized one-on-one consulting versus the provision of self support tools is a critical decision that all IT support organizations must make, and frequently revisit, to ensure that all customers are being served appropriately.

In an institution as large as the University of Pittsburgh, self support tools such as the knowledge base provide customers with the means to solve many common problems or questions on their own. This greater independence allows the central IT organization to devote additional resources to maintain and support these tools and ultimately develop and deploy other beneficial technologies early in their life cycle. Self support tools also permit the central IT organization to devote a more significant portion of its resources to resolving more demanding problems or questions and subsequently documenting such matters for others to learn from through the self-support tools. A comprehensive plan will be developed to identify self support tools and programs (expanded knowledge base) to be provided to the University community.

Certain support circumstances will always require personalized consulting services. Most self-support tools will require network connectivity, whether through direct University Ethernet and/or modem connections, or though an outside Internet Service Provider (ISP).

Personalized consulting services are well received by most customers, but are a scarce resource. Basic problems or questions that occur frequently are ideal candidates for resolving through self support tools. In-depth and/or obscure problems or questions will then be referred to personal consulting service offerings for a more appropriate resolution.

5.3. Online Technical Support Resources

Customers will benefit from the availability of online technical support resources. Current IT related resources will be centralized and expanded upon to provide customers with a single Web site from which they will obtain all related IT information and software support tools. Such resources will include an enhanced version of the knowledge base currently offered to the University community, integrated Technology Help Desk support tools allowing customers to create and view the status of support requests, and the provision of automated system tools.

Although most of the online technical support resources will be accessible by the general public, certain resources will need to be restricted to University community members. The use of authentication services, digital certificates, and smartcard technologies will be used to identify these customers when accessing these restricted areas. This will allow for the seamless integration of general support services and customer-specific services such as the Technology Help Desk support tools.

These online support resources will be regularly updated and maintained. Such resources, while designed for customer use, will also be used by IT support staff, including the Technology Help Desk. The conversion to online technical support resources will improve customer service and may eventually result in the resolution of basic support requests without the involvement of the Technology Help Desk. These resources will be integrated into the Technology Web site.

The Technology Web site will be expanded to serve as a central location for connection to University-wide technology related services.

5.4. Online Information Reference Guide

The computing support services provided to the University community will be made available through an online information and reference guide. The information available through the reference guide will include supported hardware and software products and the level of service provided for each. Service level agreements for computing services will be published.

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