Web Help for KP Claims:

Implementing a Regional Online Knowledge Base Solution

Prepared For: Sue Ann Brown
Vice President of Claims, ROC

Prepared By: Evangeline Haughney
Solution Support Services
Documentation Manager

Date: September 18, 2002

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Introduction: What is Web Help?

The health care industry is in a state of constant change. With a barrage of new products, regulations, and systems, the ability to develop and maintain knowledge has become a critical asset for competitive organizations. The need to capture, manage and leverage intellectual capital assets has caused many organizations to invest in knowledge systems, including what are referred to as "knowledge repositories or knowledge bases." The goal of a knowledge base (KB) is to enhance the performance of individuals within an organization by functioning as a real-time support agent for problem solving (Boling 350).

A common knowledge base strategy is to supply information via a corporate Intranet. Intranets are commonly used for "(1) publishing information 34%, (2) sharing knowledge (best practices) 33%, (3) delivering applications 17%, and (4) training 6%" (Ruppel 45). An Intranet strategy supports knowledge sharing in at least three ways:

- Providing compression of time and space among users
- Offering the flexibility to exchange information
- Supporting information transfers and organizational networking independent of direct contacts between users (Ruppel 38).

One way to implement an Intranet knowledge base is through Web Help. Web Help is online user assistance delivered via the Internet or Intranet. With Web Help, the HTML content can display in any web browser.

Using the web as a medium for information delivery is becoming the new industry standard. The 2002 WinWriters survey of Technologies used in information development discovered that 72% of Online Help developers create Web Help. Web Help is a frequent choice because it combines standard online navigation with the benefits of web delivery.

Here at Kaiser Permanente Mid-Atlantic States, (KPMAS), the current source of information for most departments is a hybrid mix of paper manuals and documents on a shared drive. In either format, the information is not always up-to-date and not everyone can access it, resulting in miscommunication and inconsistent processing. By using the KP Intranet to deliver Web Help, claims departments can use this knowledge tool ensure the accuracy of information, with the hope of improving the quality of claims payments.

The Purpose of this Study

As a leader in health care that is committed to being a world class health care organization, Kaiser Permanente is considering plans for a web-based knowledge base solution for regional claims departments. Based on the successful implementation of the Mid-Atlantic States Knowledge base (MASK) on June 20, 2002, Solution Support Services (SSS) Documentation team proposes the MASK Web Help model as a baseline strategy for other regional claims implementations. The focus of this preliminary report is to analyze the benefits of an Web Help solution, the options and issues surrounding a regional claims Web Help implementation, and the recommendations for the best implementation strategy.

What this Report Contains

This preliminary feasibility report includes the following information:

- Introduction
- Data sources and collection
- Benefits of Web Help
- Comparison of implementation strategies by benefits, cost, and human factors
- The MASK model
- Recommended plan for regional implementations
- Areas for additional investigation
- Conclusion
- Appendices

Data Sources and Collection

We had hoped to assess the regional conditions and needs for the development and implementation of a knowledge base, but due to time constraints, the scope of this study is limited to a study of the Mid-Atlantic States MASK implementation. As a result, the majority of data for this study was collected from the MASK project plan and implementation: Authoring Tool Requirements and Analysis document, MASK User Group commentary, and MASK Usability test results. Additional information was collected using e-mail interviews to KP Georgia claims management staff and applied research from professional journals.

Note: No other HTML editors or enterprise-level knowledge management tools were researched in this study. The first phase of the MASK project included an authoring tool assessment, which compared four different authoring tool turnkey solutions and a knowledge management solution.

From our research, the most convincing data was the 352 hits the MASK site received on Go Live (6/20/2002), proving for the first time the stability of the web server and the number of concurrent requests it could handle. Before June 20, the only measure of success was a web server stress test conducted from a trial testing tool (see Appendix C). Since the majority of the hits occurred between 9 and 10am without observable system slowness, we concluded that the MASK server is sufficient for the number of users with room for growth.

With additional time and budgetary resources, we would like to conduct a regional needs assessment, surveying each region via a questionnaire of:

- How receptive end-users would be to this change
- Web browsers installed on regional desktops
- If there is any online documentation in other regions and how it is maintained.

Due to time limitations, the only response to e-mail inquiries was with KP Georgia. To complete this study, we need to validate the Mid-Atlantic and Georgia responses against the other KP regions.

It is important to note that user surveys and tests exclusively on an individual product may not reveal all that could be understood about the effectiveness of documentation. In a similar study, technical communicator Rehling remarked, "The publications group that I studied, committed to the replacement of print documentation with online forms, never directly compared the usage patterns and satisfaction levels with print documentation to those of its electronic products" (Rehling 33). A full analysis should be conducted to avoid any usability issues with Web Help like how users in KPMAS still use The Membership System (TMS) rather than Diamond to access member and benefit information because it is easier to read.

Benefits of Web Help: Filling the Information Gap

As part of the NIS project for KPMAS, the NIS MAS Online Help system had supported Diamond and MACESS users since 1999. As users transitioned from novice to experts on these systems, their information needs changed. In 2001, Solution Support Services (SSS) Documentation began conducting quarterly Online Help Focus Groups. The anecdotal feedback from the KPMAS users is that they need clear and accurate procedures that are:

- Frequently updated
- Easy to access
- Easy to use

Some of the wish list items include:

1. Embedded User Assistance that can incorporate easily within a system (Diamond or MACESS).
2. A central location to house all departmental Policies and Procedures.
3. Secure logins to access the knowledge base remotely, or a way that only certain users can access certain info.

Benefits of Web Help: Reducing Costs

The main reason why companies switch from paper to online documentation solutions is that online distribution is cheaper than paper. "At Intel the cost of delivering information electronically, as through a Web page, is one-tenth the cost of a traditional support phone call" (Mead 370). From the "Printing Services Costs" from the Systems Training and Publications IT group: 300 large booklets (Quick Reference Guides) cost $155.18 to manufacture. Multiply the printing costs by the number of updates per change and the costs increase considerably. For the 1200 users in KPMAS impacted by claims systems, creating 300 page binders at 6 cents/page for each user can cost up to $24,000.00 (source IKON Office Services).

Not only is it more costly but bulky paper documentation can often be hard to use. Packaging normally involves large 3-ring binders, with punched replacement sheets for updates. A web site only requires an interface and icons. The manuals are too bulky to take along off-site. The punched up sheets are difficult to maintain, and printing and shipping are expensive (Rehling 28).

In terms of IT costs, the initial setup of Web Help involves initial software and hardware setup and a low level of ongoing maintenance. The KP Intranet already exists, and web browsers are included with desktop Windows operating systems. For the MASK implementation, we reduced the drain on KPIT resources by eliminating the monthly distribution of desktop WinHelp files. Every month at least two IT programmers would have to package the files for automatic distribution. In addition, if the monthly automatic desktop push failed, Desktop Engineers would have to visit each PC that did not receive the update to manually intervene.

Online content allows organizations to leverage existing documentation, saving both time and resources. Existing legacy documents that are in Microsoft Word can easily be converted to Adobe PDF or HTML with current web-authoring tools so there is no need to re-type thousands of pages of legacy documents. In addition, online information allows for single sourcing where one set of documentation can be re-used for multiple areas within an organization. For example, the procedure to validate member status is the same for multiple departments: Membership Accounting, Member Services, Claims, and Utilization Management. Information developers only need to update one source of online documentation for multiple audiences.

Benefits of Web Help: Efficient Delivery

As soon as a manual is printed, it's out of date. Some industry analysts estimate that "18% of corporate documentation is obsolete within 30 days. For some groups, such as customer service, internal documents need to be updated on an almost daily basis" (eHelp white paper). This was the main reason for the creation of NIS MAS Online Help, a windows help system to support the HSD Diamond implementation and subsequent upgrades. Although NIS MAS Help was an online source for information, the delivery mechanism did not support timely and accurate procedures.

NIS MAS Help was distributed via Tivoli to over 1200 desktop PCs each month. The regular percentage of Tivoli failures resulted in differing procedures from one desk to another. The limited number of IT desktop engineers resulted in a slow turnaround for service requests to manually update PCs where the desktop push failed. Business owners and end-users were increasingly frustrated with the long delay between updates and writers were concerned with the ineffectiveness of the documentation and the devalued the worth of the Help system.

One alternative to paper distribution is via e-mail. Unfortunately, in KPMAS, not all users have e-mail accounts or access to e-mail. A repository of MS Word documents on a shared network drive allows for one source of online information, but not all KPMAS users have access to the same network drive. It's also time consuming to have to drill-down through several folders to find what you are looking for.

By publishing information to a web server, users have immediate access to critical updates and new product information. Writers can publish on an as-needed basis, rather than be tied to monthly desktop IT release dates. Web distribution increases the level of access for employees who travel such as roving nurses, and MARS representatives at network facilities. Granted, with online information, it's harder to read information on a screen than on paper, and people will continue to print out what they want to read, but a web-based system increases the speed that users can find the information.

The common drawbacks to using web-based information systems are the dependency on a fast network connection and having to continually upgrade web browsers to support a full feature set

of web content. However, these drawbacks are controllable. Based on the demand for the growing number of web applications in the organization, KPIT continues to upgrade network connections and the standard desktop web browser.

Benefits of Web Help: Accurate Documentation

It doesn't take much to play out the worst-case scenarios. One out-of-date procedure could instruct claims processors to pay claims at the wrong per diem rate, deduct the wrong copay amount, or deny for no authorization. The goal of a knowledge system is that by improving the quality and accuracy of information a knowledge base can support the reduction of errors and the resulting monetary cost.

The April 2002 KPMAS Claims Quality Audit Report showed that 53% of clerical errors were categorized as "procedural." These procedural errors resulted in $9,898.52 in claims overpayments. The amount of underpayments was almost identical, with $9,655.72 in claims underpayments. Multiply this out for the entire year, and we are losing in one region almost $120,000.00 in processing errors.

Unfortunately, it is difficult to develop performance metrics for processor quality based on the documentation because the link between accurate documentation and processor errors is not a direct one. Continuous processing improvement includes analyzing processes, communicating new procedures, training new procedures, auditing, and reporting on continued areas for improvement.

When processors prefer to ask their neighbor instead of checking an online repository, it does not matter if the online information is accurate if it is not used as a resource. Developing a procedural compliance process requires both positive and negative reinforcements to motivate behavior. We need to "demonstrate how [Web Help] could save employees time gathering information and checking potential problems…and to start using the Intranet as part of a method to check the completeness or quality of their work" (Ruppel 49).

Once users are motivated to use a Web Help system, continuous process improvement is made easier by server technology. A new feature of the RoboInfo Enterprise Web Help solution allows the server to automatically and autonomously track queried input and store and sort by relevancy. These End-User Feedback reports such as Unanswered questions, Frequently asked Questions create a direct link to return on investment for training and documentation improvement. The reports identify topics that need to be written, concepts for re-training, or even identify improvements in application design based on the number of times a context-sensitive topic is called. The reports can be sorted by date range to see the effectiveness of a new training class or the impact of a new process change. For the first time a turnkey tool sheds light on the previously non-quantifiable measures of success.

Question	% of Total	Times Asked
⊟ dual coverage	2%	22
...DUAL	1%	13
...dual coverage	1%	5
...How do I work dual coverage?	<1%	2
...WHAT IS DUAL COVERAGE	<1%	1
...PROCESSING DUAL COVERAGE	<1%	1

Figure 1. 0 MASK Frequently Asked Questions Report

Benefits of Web Help: The New Industry Standard

NIS MAS Help, originally developed to support the Mid-Atlantic Diamond implementation, was created in 1999 in WinHelp and provided an online mechanism for distributing system documentation and policies and procedures. In 2001, when I attended the TechComm 2001 conference, WinHelp technology was mentioned as an afterthought. The conference seminar focus was on HTML and other web-based technologies.

"WinHelp is officially dead…the market is starting to move beyond WinHelp's older design and coding style, which means that more and more WinHelp developers are starting to convert their material to HTML-based help formats" (Perlin). The 2002 WinWriter's Survey mirrors Perlin's observation. For Technologies, "72% are developing Browser-based Help, and 35% are developing Microsoft WinHelp." The 2002 versions of eHelp authoring tools no longer support new WinHelp features.

Web-accessible documentation is becoming the standard expectation. New development tools are following the software industry and with the boom in web application and web site development, user assistance needs to support multiple web browsers and be portable across operating systems.

Why should KP use eHelp's RoboHELP as the tool to develop Web Help? EHelp's suite of Help Authoring tools owns a large percentage of the software documentation market share and is relatively easy to learn and use. From the 2002 WinWriters Survey on Tool Usage "70% use RoboHELP. RoboHELP dominates the Help authoring space with over two-thirds of the respondents using one of the versions of the popular eHelp product." "The reasons why many companies use RoboHELP is the rich feature set. 2002 WinWriters survey: Desired Web Help Features, 79% Index, 78% Expanding/collapsing TOC, 76% Full-text search, 6% Natural Language Search. RoboHELP supports traditional navigation components with a familiar book and chapter metaphor. The need for standard navigation tends to increase with the power and complexity of a product" (WinWriters).

Built-in navigation tools make a quantifiable difference. JoAnn Hackos, in her study of Federal Express Ground Operations Policies and Procedures manuals conducted a usability test of the manuals with test subjects drawn from the ranks of Federal Express employees. Under controlled conditions, the test documented the amount of time it took to find correct answers to questions using the P&P manuals, employees' unwillingness to use the P&P manuals because of their difficulty, and the importance of task-oriented supporting documents such as quick-reference cards.

"On the basis of the initial usability test results, we calculated the potential cost of lost time in searching for information. Based on a very conservative estimate of two long searches per month

and using the average cost of an employee in each of the three job categories, we calculated that it would cost the corporation at least $3,000,000 per month in unproductive time. We did not calculate the cost of finding and acting on the wrong answers to questions, but believe such cost to be high. With the old manuals only 38% of searches were completed in under 3 minutes, new manuals 64% in under 3 minutes, savings of $400,000 in the first year of productivity gains" (Mead 360).

Other forward thinking departments in KPMAS have made the decision to implement web-based information systems such as IBM/Lotus Domino.doc (Resource Central) for Member Services. In addition, General Accounting places their departmental policies on the KP Mid-Atlantic Intranet site. By converting to HTML, online information will be poised to advance to an enterprise-level knowledge management solution.

Benefits of Web Help: Direct Assistance with the Turnaround Effort

"Information can directly produce revenue; this realization is taking hold at many progressive companies. This will require the businesses we work for to realize that their main products are information and knowledge, not software, appliances, chemical, etc. and to redefine their business models accordingly.

Thus, information has a direct value, one that is difficult and important to measure. Direct value is a measure of customer satisfaction, which produces repeat or increased sales, and a higher price. Customer satisfaction, in turn, is a function of product quality, which, for documentation, is the ability of the document to help solve the customer's problem, through its clarity, accuracy, and fitness for the task and audience" (Mead 373-4).

It is important to note the link between customer satisfaction and accurate information. Our regional goals for KPMAS during the turnaround effort are to reduce costs and improve customer satisfaction. The ability to deliver accurate online information to enhance the quality of an organization is a major contributor for several key KPMAS turnaround initiatives.

The table below identifies several 2002 KPMAS turnaround initiatives and ways that a Web Help system (MASK) directly supports these projects:

KPMAS Initiative	Supported by MASK
1. Establish a claims quality program for measuring and reporting claims paid correctly for data and financial accuracy	➢ Claims desk-level procedures, job aids, soon policies online
2. Improvements and adjustments to the Diamond software used for processing claims	➢ End-user documentation for all Diamond upgrades
3. Claims inventory ten days on hand: Replaced front-end technology with MACESS software, enabling auto-adjudication, and enhancing EDI	➢ End-user documentation for MACESS
4. Collect appropriate member/third party payer financial contributions for the cost of care – new re-designed coordination of benefits (COB) processes and continuing to build our IT module to also support these new COB processes	➢ COB manual online, in negotiations to support TPL module

KPMAS Initiative	Supported by MASK
5. Develop policies, procedures, and training programs to enhance member services first-call resolution 6. Evaluate and select a customer contact management solution: MACESS software implementation 11/15-29/2001 in member services, claims, membership accounting	➢ Member Services Job Aids online ➢ End-user documentation for MACESS

Figure 2. 0 Table listing the KPMAS initiatives supported by online documentation

Comparison of Implementation Strategies

The reasons why we need to implement a Web Help strategy are clear:

- Reduce the cost of paper documentation
- Improve the efficiency of information delivery and thereby the accuracy of procedures
- Align with the new industry standard for online information

The two options for proceeding with Web Help discussed in this report distill down to technology and geography. Kaiser Permanente President and CEO George Halvorson discusses the benefits to both options to in his 6/21 memo to, 1) maximize the strength and size of our organization to centralize our systems, or 2) focus on our regional strengths.

> *A "national systems strategy" does not inherently mean systems "consolidation." Consolidation into shared services may make sense in some areas, but not in others. We need to figure that out area by area. ...there is great strength in a regional model. Regions, run well, can focus on the local markets, local situations, and local performance. Simultaneously, there is great potential system-wide synergy that can result from various Regions individually being creative – pioneering various approaches to certain aspects of service, quality, and care. "Nationalizing everything," as one extreme option, would be a major mistake, in my opinion, because there is a real strength that can result when Hawaii has the ability to respond directly and creatively to Hawaiians. We can learn from these local experiences. On the other hand, it's also true that one of our strengths and assets as a mega system is our sheer size. Size gives us opportunities for sharing of processes, learning, and systems in ways that could and should significantly improve some services and substantially reduce some costs.*

This section contains an analysis of one central web server or individual web servers for all KP regions. With one large server and multiple RoboEngine licenses, authors in different regions all publish to the same location in one master merged Web Help system. With multiple servers, each region has a web server and uses the same consistent design to develop regional Web Help systems. Regional teams work on each set of specifics for that region. For either option, common system instructions can be single sourced (written once, linked multiple times).

The figure below shows a representation how the Table of Contents would look for one consolidated server project, or for one individual regional server.

Figure 3. 0 Table of Contents for centralized web server

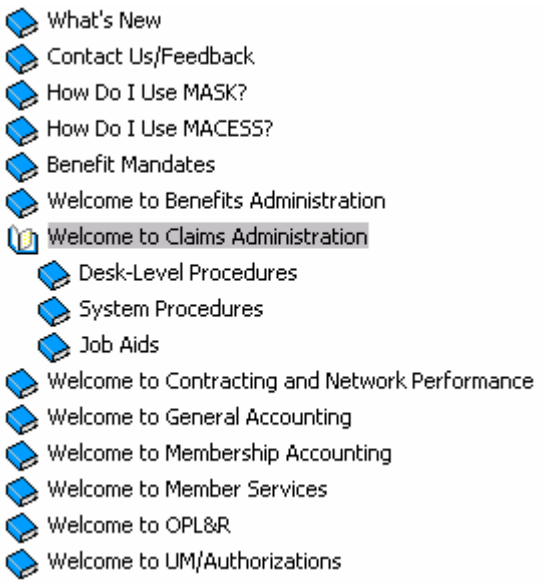

Figure 4. 0 Table of Contents from regional web server (MASK)

The next section of this report evaluates the following criteria for both options:

- Financial cost
- Qualitative benefits
- Impacts to other systems and processes
- Perception/Change Management issues
- Human Factors

What is the Economic Wisdom for One Server or Regional Servers?

The biggest plus for one server is that it requires one server and one server license. In addition, the cost of one large site server ($29,000) is less expensive than the total cost of multiple smaller servers ($48,000). With one server you only need one maintenance and support plan. One sever implies one set of consolidated IT resources, and training only one set of writers. With one development team there is the potential for reducing training costs by only sending a few team members to a vendor training, and then use a train-the-trainer approach for the rest of the team.

Implementing multiple servers for each of the regions (Colorado, Hawaii, Georgia, Mid-Atlantic States, Northwest, and Ohio) require individual server software licenses and separate server hardware for each region. Since two of the claims regions have less than 50 claims staff (Hawaii and Ohio), it may be possible to recycle existing smaller file servers that IT is not using.

Here is a breakdown of the estimated hardware and software costs for one large server or multiple servers:

	One Server	Regional Servers
Server Hardware	$ 30,000.00	$ 48,000.00
Test Server Hardware	$ 3,000.00	$ 18,000.00
Software		
RoboEngine	$ 10,794.00	$ 10,794.00
RoboInfo Publisher	$ 26,985.00	$ 26,985.00
Visual Source Safe	$ 3,600.00	$ 3,600.00
PaintShop Pro	$ 1,050.00	$ 1,050.00
Acrobat	$ 1,800.00	$ 1,800.00
Windows 2000 Server w/ IIS	$ 350.00	$ 2,100.00
Training	$ 19,485.00	$ 19,485.00
Support	$ 11,083.00	$ 11,083.00
Resources	$ 103,200.00	$ 169,200.00
Total	**$ 211,347.00**	**$ 312,097.00**

Figure 5. 0 Cost comparison of web server options

What are the Qualitative Benefits for One Server or Regional Servers?

Note: For either option, the benefits are dependent on using RoboInfo Enterprise and the MASK interface design and template.

Qualitative Benefits of One Server

The advantages for using one consolidated web server boil down to the consistency and control that a single development team can maintain with one design, one set of standards, and similar writing style. A consistent naming convention enables multiple authors to share writing responsibilities by making it easier to locate HTML files on the server. Another consideration is that when new modules need to be incorporated in the Web Help system, one centralized team is more familiar with the limitations and workarounds of the configured HTML file directory architecture. When authors delete or move HTML topics these topics must also be updated from the web server.

The communication dynamics between a development team must also be considered. In order to create links from one Web Help project to another, team members must use relative linking (../../myfile.htm). Since relative linking requires the developer to manually code in a "relative path" to a HTML file in a specific file directory, knowing where that file resides and what it is named are critical to success. From personal experience, it is hard enough to coordinate this each week with a team in the same office, much less with a team of remote authors in different time zones. The communication required for this process is like operating on a patient with the anesthesiologist in Colorado, and the surgeon in Georgia. Another issue is if remote regional developers don't have access to the same systems, servers or shared drives (or do, but have painfully slow response times), both the quality and productivity of a documentation team are at risk.

The benefits from an IT perspective are that only one server requires one set of IT network engineers and desktop engineers to support one set of developers. A larger file site server will need to reside at the Silver Spring data center, ensuring 24-hour maintenance and speedier disaster recovery. Since all Windows 2000 servers currently reside at the Silver Spring data center, the repository of Windows 2000 server expertise also resides at the data center.

Qualitative Benefits of Multiple Servers

The greatest advantage to multiple servers and therefore multiple development teams is the flexibility to customize information to each regional audience. In the software development field, the term "localization" is often defined as simply translating to a foreign language, but the essence of the process is to "localize" the tone, language of information. With one large server, all projects from each region will be merged, including regional jargon in the index. There is a potential for information liability if the same word or acronym means different things in different KP regions.

Regions can develop more of a sense of ownership over their Web Help system by customizing the system name or incorporating cultural differences. One set of users may prefer bright colors and animation, while others may prefer white backgrounds and plain text. Regions can further customize their design and not be tied down to lowest common denominator web browser.

Regional teams can use advanced options for navigating and controlling the display of information such as expanding/collapsing DHTML and animated graphics. With less rigidity in the design, regions can independently rearrange the Table of Contents, and have separate publishing dates. With a 12-hour time difference between the East Coast and Hawaii, separate development teams remove the administrative layer of coordinating updates and content deadlines. One advantage over a consolidated server is that if the regional server goes down, it is only for that region. Smaller projects equal faster compile times, placing fewer burdens on the network when publishing changes.

Development teams located within a region have access to all the Subject Matter Experts (SMEs) and regional systems to capture screen shots, conduct testing, and facilitate the review process. Writers can specialize by area and develop relationships with departmental SMEs and managers. The size of a regional audience may allow for inclusion of other departmental Policies and Procedures. Regions differ by business models, so to include all Authorization topics in one bucket may not work everywhere. For example, in KPMAS the Other Party Liability & Recovery/PBS department separates Coordination of Benefits from Claims to report under Finance.

Turnover in each regions may vary. One region may want to address a new hire audience vs. existing employees. PC skill level can also vary by region. The only responses to our questionnaire were from KPMAS and KP Georgia. Both regions were similar in PC skill level and perception of online information, but further investigation is needed to assess the regional needs

What is the Impact to Other Systems for One Server or Regional Servers?

Note: During my initial research we learned that not all regions are in full compliance with the current KPIT desktop standards. Currently, the current KPIT standard for the default web browser is under review to switch to Internet Explorer 5.5 from Netscape Navigator. RoboInfo Enterprise runs best on Internet Explorer but the rollout for compliance is not due until 2004.

In addition, the server architecture for a common claims systems strategy is also still in the planning stages. Given the amorphous details surrounding this subject, I will highlight potential issues that could impact either server strategy. Once a national standard is established, I plan on re-visiting this section.

The current KPIT standards are:

- Web browser: Netscape Navigator **(In Review to switch to Internet Explorer 5.5)**
- HTML editor: Dreamweaver
- Web server operating system: IBM Websphere

The MASK model for Web Help uses only one of these standards and required administrative waivers from KPIT prior to development. Currently, the KPIT standard desktop image sets Netscape as the default browser, but Internet Explorer is installed on every PC. For the MASK implementation, for usability reasons, we decided to automatically launch Internet Explorer from the MASK desktop icon. Implementing a consolidated web server strategy will require a similar desktop icon installation until Internet Explorer is set as the default web browser.

The existing MASK server is a Compaq Pentium III 500 MHz, 500MB RAM, 3GB free disk space running Microsoft Windows 2000 Server with IIS. With Paessler.com's web server stress testing tool we validated that the existing MASK server can handle 3755 hits per hour so we can extrapolate that one server can handle the requests of 537 regional claims staff each day. (See Appendix C).

An additional consideration for a consolidated server is the increased complexity for feedback reports. A more complex Web Help system may require the purchase of eHelp's database connectivity pack to standardize reports on an Oracle database instead of MS Access. "Each help site is mapped to one unique database. The database can be either in an MS Access file format (.mdb), or the data can be stored on a SQL server or Oracle database. In order to utilize SQL or Oracle for the database format, a Database Connectivity Pack license must also be purchased. Site traffic is the primary reason to use the Database Connectivity option. If you are planning very high traffic on your help site, you may consider starting with a SQL or Oracle database on a fairly high-performance machine with a large amount of free disk space. If you are planning on low traffic, or are expecting a gradual increase, you may consider starting with an MS Access database and upgrading later" (eHelp's RoboInfo Knowledge Base #33292).

Another potential impact for future development is that to test embedded Web Help calls to other applications, each application requires access to the regional web server. For example, if Hawaii implements HSD Diamond on a separate server, developers will need to keep track of greater permutations of *map IDs* (alias file names used to link help topic files to Applications).

However, we cannot consider either server option without looking at the KPIT Server consolidation strategy: "Servers and storage should be consolidated as much as possible to reduce TCO (Total Cost of Ownership.) However, the end-user experience must not be noticeably affected as a result of consolidation. Tier 1/Data Centers: Corona and Silver Spring Data Centers are targeted as the central aggregation point. Before consolidating by server function, need to conduct an analysis of the benefits of consolidation: Availability, Fault-tolerant infrastructure, Staff Expertise. The risks of consolidation are based on the increased number of people dependent on a resource. Precautions must also be made to protect against power outages,

network outages, and malicious attacks. Precautions must be taken to protect against natural disaster such as fire and earthquake" (KPIT).

What is the Impact to Current Processes for One Server or Regional Servers?

It may seem like apples to oranges, but "imposing a technology that radically changes the culture or bypasses the usual organizational chain of command, as Intranets do, can result in power struggles and unexpected resistance. One approach is to piggyback sharing knowledge onto other key business initiatives or onto efforts to solve specific business problems" (Ruppel 49). I'll discuss change management issues specifically in the next section, but even in a seemingly positive change, implementing web server technology will impact how users access the information and how it is developed.

For either server option, end-users will require some level of training on Web Help's navigation, and the use of a web browser. Training will be needed for PC-phobic users, but the MASK implementation required minimal training. Each user received a Quick Reference Guide and one hour In-Services continue to be presented by request. For continual training, "Using MASK" is incorporated in all New Hire training classes.

For regional development teams, new staff and skill sets are required such as a working knowledge of HTML. Individuals involved in the process need to constantly assess the value of new items to end users compared with the drawbacks of making the knowledge base too large" (Boling 536). As the scope expands to meet the demands of the users, decisions of what makes an impact on the knowledge base become more complex.

"For example, [a company] might decide to change its supported antivirus software to Norton Antivirus. This change would require this line of thinking: do we need a new document that covers where and how to get Norton Antivirus? Which existing knowledge base documents talk about the previously supported antivirus software, and are they still relevant – at this company? Do folks elsewhere still use that product? Should these documents be modified to include information on Norton? At [company X], a support center staff member is assigned to watchdog newsgroups and to attend weekly change management meetings where most new services and policies instituted from within [company X] are announced" (Boling 537).

Subject Matter Experts who used to submit changes in e-mail or Word can continue to submit edits or new documents in MS Word, Excel, or PowerPoint, but a template needs to be established up-front with them so that additional effort is not wasted when importing files into HTML. For example, sometimes tables in MS Word do not retain their margins or formatting in HTML and the developer needs to manually edit the HTML true code. Using a Word template can save development time and the consistent page layout also enhances the usability of the system.

For regions that have limited experience with the web, the transition to Web Help will make a huge impact as these users struggle with the concept of change. With the MASK implementation, we found that a smooth transition curve required motivation planning months before Go Live. For example, we established a MASK User Group to assist with Usability testing and distributed gift certificates and mentioned their names in a newsletter for public acknowledgement of their assistance. The User Group brainstorming sessions identified several ways to use negative reinforcement: linking audit results to whether the information is in MASK, or receiving demerits if you are seen using an old binder manual. While these ideas are creative, what is absolutely required is management support and promotion of the use of Web Help.

What is the Perception of Web Help?

Perception controls expectations and how people approach change. Our original analysis of sponsorship targets for the MASK project concluded that managers see this as either 1) an opportunity: a situation that can be exploited for future success or 2) a need: a current situation that could become problematic.

The biggest challenge in a Web Help implementation will be facilitating a cultural change in our organization. "Evidence suggests that employee acceptance or resistance to Intranets as a knowledge-sharing environment is a management and corporate culture issue rather than a technology issue. A 1999 (best practices) study by the American Productivity and Quality Center found that a company's ability to use technology to share knowledge is based on employee enthusiasm, or lack thereof, which in turn is rooted in the corporate culture or subculture"(Ruppel 38).

"Mistrust is an aspect of culture that has a negative impact on building a KM culture, whereas 'pleasure in helping others' has a positive impact. Therefore an organizational culture that is not conducive to Intranets is one that emphasizes unilateral control, maximizing winning and losing, and minimizing the expression of negative feelings. This environment can create miscommunication, mistrust, protectiveness, and escalating errors" (Ruppel 39). Users view "sharing knowledge as an 'unnatural act.' Therefore, for firms where employees are concerned mainly with their own best interests and there is a low level of trust, the inherent sharing of information on an Intranet is counter-cultural. Employees may fear sharing knowledge for fear of becoming redundant, giving away expertise, or being embarrassed. Employees who lack control or power may use knowledge as a control and defense device unless they feel that they will be treated fairly and respectfully" (Ruppel 42).

Organizations that "reward members for innovation and learning can cause new insights to grow out of new IT implementations. Otherwise, the existing culture may find a way to preserve old forms, such as face-to-face meetings or hard copy documents, despite electronic alternatives, because the old forms are part of the employees' ingrained habits and are familiar and comforting to organizational members" (Ruppel 39).

In KPMAS for the MASK Go Live, we conducted a two-month long communications effort combining contests, newsletters, memos, roadshow demonstrations, on-site floor support and departmental In-services. The usage results from the MASK Go Live show that 352 users opened up the MASK site. The ongoing battle will be to maintain those usage statistics on a regular basis. Three months later in September, 2002, we find that continued communication and a cyclical compliance plan that weaves in audits, training and weekly team meetings is necessary to motivate users to read consistently, learn, and apply their new knowledge.

The figure below shows the usage statistics from the week of Go Live for the MASK system.

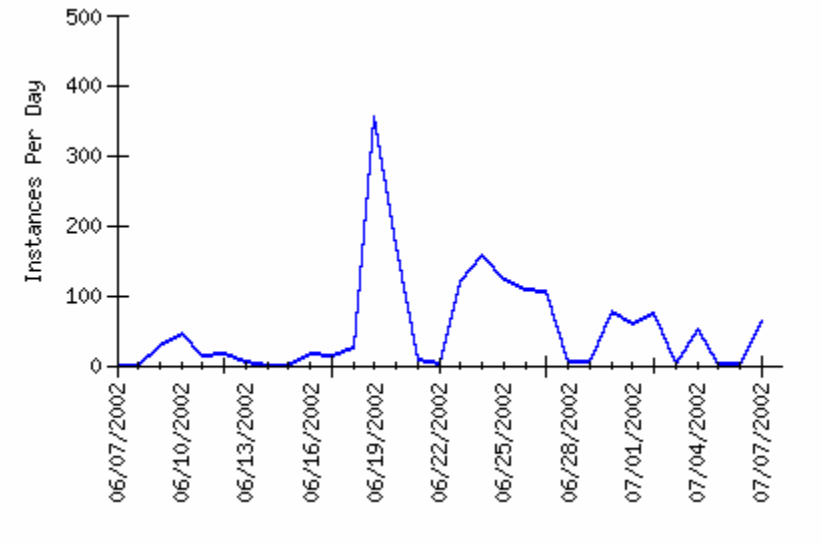

Figure 6. 0 MASK Usage Report from Go Live

What is the perception of online information in other KP regions? A response from the KP Georgia region states that KP Georgia is "making tremendous inroads toward on-line reference tools…We currently have all compliance and HR policies on-line here in Georgia. Any specific departmental policies are still distributed via email and physically handed out in meetings when appropriate for discussion. They are maintained by each staff member in their own personal records, as well as, by their manager" (Koski). Further analysis needs to be conducted in other KP regions. Due to the preliminary nature of this study, only KPGA and KPMAS were contacted.

A traditional barrier to using online help is the perception of the value of productivity over quality. During one of the MASK User Groups we heard comments that certain processors were fearful of using Online Help since they thought that to their supervisor it appeared as if they were not working. For these users, a web-based tool may surface concerns that time is spent surfing the Internet rather than processing claims. One way to counter this is to obtain full buy-in from all levels of management, and to have supervisors actively use Web Help on a regular basis.

"Consider the impact of culture on this worker-driven knowledge system. The enthusiasm of knowledge workers in this system is a fresh reminder of the importance of organizational culture to the success of any effort such as this one that relies heavily on human participation. 431 organizations' knowledge management practices found that 54% of managers surveyed consider culture to be the single biggest impediment to knowledge transfer. That the people who contribute to the KB appear "bought in" and committed to the effort reinforces past findings that speak to the critical role culture plays in successfully launching any knowledge management campaign" (Boling 541).

Human Factors/Usability: Will they use Web Help?

Web Help is a proven vehicle for delivering information but information needs to be read and usable to make an impact.

So how do users read on the web? "They don't. People rarely read Web pages word by word; instead they scan the page, picking out individual words and sentences. In a recent study John Morkes and I found that 79 percent of our test users always scanned any new page they came across; only 16 percent read word-by-word" (Nielsen).

In addition, "user characteristics such as gender, culture, age, education, and computer skills further create multiple audiences even within the same location. Users with disabilities add to the diversity of the already varied multiple audiences. These needs must be taken into account in Web site design" (Lin 40). "Even when common sense, research, and experience suggest that people learn differently, many professionals continue to treat learners as a homogenous audience with a "one-size-fits-all" approach" (Martinez 471).

For multiple servers, the benefits are that information design can be tailored to each audience. "Page layout is a strategy that can be used to accomplish the goals of inclusion. The communicator can try to control access by addressing one audience at a time. When designing these pages, the designer would take the cultural attributes of that particular audience into consideration. The audience's preferences of colors, graphics, and textual organization ought to be respected" (Lin 40). Any new regional design will need to pass end-user approval through usability testing of the prototype design and final deliverable.

The benefits of one server are consistency in the presentation and organization of information. The MASK design has already been through usability testing with analysts claims processors, nurses, and management staff in the Mid-Atlantic States region. MASK uses a standard Table of Contents navigational structure and in other studies "users especially liked the book metaphor interface, which had been developed by a specialist in both human factors and graphic design, then fine tuned based on results of prototype testing" (Rehling 29).

From the MASK Go Live we received several unsolicited comments on the ease of use of the system:

"It all looks self explanatory. I went out and played a little on it and it appears to be very user friendly." – Chris Sullivan, ROC Claims
"MASK works so well and so quickly. It took me less than half the time of the old system to find something convoluted, and before that I used to sift through papers! MASK is wonderful, and kudos for a great tool." – Becky Mayo, Configuration Analyst

The Mid-Atlantic States Knowledge-base (MASK) model

The Mid-Atlantic States went live on 6/20 with an online information system for KPMAS health plan departments. The Mid-Atlantic States Knowledge-base (MASK) is a Web Help system that hosts HTML content on a Kaiser Permanente Intranet site. After researching several Help Authoring Tools, SSS decided to implement eHelp's RoboInfo Enterprise for the following reasons:

- A Web Help system can be accessed from any PC in the Kaiser Permanente network
- HTML content and web-browser based online information systems are the new industry standard
- Natural Language Search capability (similar to "Ask Jeeves")
- End-user feedback reports

Using MASK

End-users of the MASK site can search the knowledge base by entering questions in a search engine that returns topics with the phrases or keywords contained in the question. In addition, MASK contains the industry standard Help navigation aids of Index and expanding and collapsing Table of Contents. The Table of Contents is arranged in alphabetical order by Mid-Atlantic States Health Plan department, with sub-chapters for departmental policies and procedures, desk-level procedures, system documentation, and Job Aids. Whether the end-user searches for information through the Search tab, Index tab, or Table of Contents tab, clicking the displayed results brings the user to a HTML, PDF, Word, PowerPoint, or Excel topic that contains policies, procedural instructions, definitions, or Job Aids.

Recommendations

Since the current systems situation is still pending, (which web browser we will standardize on, which core claims systems will be implemented?), Kaiser Permanente is not ready to implement a centralized server strategy. Our recommendation is to proceed with regional Web Help systems for an immediate return on investment while a core systems strategy is developed. The flexibility of regional systems enables customization of information for each audience, which can help ease the transition to web-based information systems for end-users with limited web experience. Ultimately, a regional Web Help system serves as a stepping-stone for a future enterprise-level KM solution.

Some of the specific recommendations are:

- Conduct a regional assessment to define end-user perceptions towards online information. Send out a questionnaire to each claims region and conduct on-site follow-up visits.
- Use the base MASK navigation design and customize the Table of Contents and HTML content for each KP region. Consolidate any existing policy and procedure documentation into Microsoft Word. Develop a style standards document or use the MASK standards template. Replicate this template across the regions to maximize consistency.
- For regions without a technical communications team, allocate SSS Documentation to provide consulting expertise for regional implementations. SSS can assist with estimating the resources required for the initial documentation development effort as well as any troubleshooting or technical assistance.
- Encourage managers to reward employees for using the knowledge base.

Conclusion: What are the Opportunities?

"A successful KM implementation has been identified as transformative to the organization and its culture. Managers believe that many of the most important gains from Intranets are in improving worker productivity and morale, decision making, and information sharing" (Ruppel 38).

The original National Insurance Solution (NIS) vision was to transform Kaiser Permanente into a world-class claims operation through a network of common systems and best practices. Web Help opens the door for communities of practice and knowledge sharing by developing a culture

of knowledge that increases the opportunities for further compliance with corporate, industry, or government regulations.

Here at KP we need to continually develop education strategies to support users as technology becomes more pervasive. Patient and claim information provided by systems is only valuable if the user can effectively and correctly use the latest technology to the full potential (Nussbaum and Ault 2).

The direction of the IT industry is moving towards the web. Web-based tutorials, web-based training, web-based applications, Web Help all use the Internet or Intranet for similar reasons:

- Effective delivery of information
- Increased range of communication
- Reduced cost of conventional training or paper manuals
- Reduced cost of IT infrastructure and maintenance

The benefits of implementing a Web Help solution with either one server or regional servers are worthwhile for either option. One server provides consistency of information and requires only one area of IT support. Multiple servers allow for customization to each region, more relevant information, and local control. Even though there is a $100,000.00 estimated difference between implementing one server and implementing regional servers, the short-term costs become benefits in the long term (Senge). $100,000.00 spread out over a period of time for six regions buys flexibility and the ability to adapt to change specifically and strategically.

Areas that Require Further Investigation

- Conduct a regional IT desktop audit of installed web browsers
- Define the scope of regional Web Help implementations. Should we implement in Claims Administration only or in other departments?
- Conduct a cost-benefit analysis of implementing either Web Help or an internally developed solution
- Research the costs involved with embedding Web Help within Diamond and MACESS
- Develop a consistent and repeatable documentation process
- Establish a benchmark cost for each regional documentation effort
- Correlate auditing errors with MASK topics
- Establish quality performance metrics for MASK which are linked to a Policies and Procedures compliance program.

Appendices

Appendix A: References

Birch, Brian. March 25, 2002. KPIT Enterprise Planning & Architecture Position Statement. July 2, 2002. <http://kpnet.kp.org/kpit>.

Boling, Elizabeth, et al. "Knowledge Base Development: The Life Cycle of an Item in the Indiana University Knowledge Base." *Technical Communication* 47 (2000).

EHelp corporation, "Publishing Policies & Procedures Online: How and Why Companies are Maximizing Their Internal Information." (2002)

Koski, Steven. "Questions on Georgia use of Online Help." Email to the author. July 2, 2002.

Lin, Canchu. "Organizational Size, Multiple Audiences, and Web Site Design." *Technical Communication* 49 (2002).

Martinez, Margaret. "Using Learning Orientation to Investigate How Individuals Learn Successfully on the Web." *Technical Communication* 46 (1999).

Mead, Jay. "Measuring the Value Added by Technical Documentation: A Review of Research and Practice." *Technical Communication* 45 (1998).

Nielsen, Jakob. "How Users Read on the Web." *Jakob Nielsen's Alertbox* October 1, 1997 <http://www.useit.com/alertbox/9710a.html>.

Nussbaum, Gerard M. and Ault, Star P. "Beyond 2000: Innovative Solutions for the Evolving Healthcare Information Management Environment." *Journal of Healthcare Information Management* 14 (2000).

Perlin, Neil. "Practical Magic: Converting WinHelp to HTML-Based Help." Hyperviews: Spring 2001. August 6, 2001. <http://www.stcsig.org/oi/hyperviews/archive/01Spring/012cmagi.htm>.

Rehling, Louise. "Print to Online: Conflicting Tales of Transition." *Technical Communication* 46 (1999).

Ruppel, Cynthia P. and Harrington, Susan J. "Sharing Knowledge Through Intranets: A Study of Organizational Culture and Intranet Implementation." *IEEE Transactions on Professional Communication* 44 (2001).

Senge, Peter. "The Fifth Discipline: The Art and Practice of the Learning Organization", New York: Doubleday/Currency, 1990.

<http://www.helpcommunity.ehelp.com>.Multiple Servers with Enterprise, message #33292

"2002 WinWriters Skills and Technologies Survey" WinWriters July 2, 2002. <http://www.winwriters.com/skillstech02_webhelp.htm>.

Appendix B: Minimum Requirements for Web Help

Since the KPIT standard web browser is Netscape, any web-based system must run on both Netscape and Internet Explorer. Server software must run either on NT servers or IBM Websphere (standard), to conform to KPIT standards.

Minimum Requirements

Server requirements and maintenance
Intel Pentium III processor 450MHz or faster
128 MB RAM minimum
50 MB of disk space for installation
50 MB of free disk space after installation (for optimal performance)
Microsoft Windows NT 4.00 Server with IIS 4.0 or Microsoft Windows 2000 Server with IIS 5.0

S/W requirements for RoboInfo
IE 5.5 for the fastest download and display.
IE 4.0 – index bleeding, missing graphics for NLS results

Appendix C: Web Server Stress Test Results

Stress testing from www.paessler.com/WebStress

Results of run 1

Created 5 requests in 11.261ms (equals ~444 requests per second)
Time to first byte: ~103 msec
Average User Wait Time of all Users: 1107 ms
Average User Bandwidth: 89.774 kB/s
Hits per Second: 1.043 (equals 3755.299 Hits per Hour)
Users per Second: 1.043 (equals 3755.299 Users per Hour)
Average User Wait Time of all URLs: 1107 ms
Total Bytes: 1330797 Bytes (1330 kB) (Throughput ~278 kB/sec)

Appendix D: MASK Project Plan

⊞ **Planning Phase**	**160 days**	**Mon 8/6/01**	**Fri 3/15/02**
⊞ **Design Phase**	**198 days**	**Fri 9/28/01**	**Tue 7/2/02**
⊞ **S/W and H/W setup**	**58 days**	**Mon 3/4/02**	**Wed 5/22/02**
⊞ **Conversion Phase**	**50 days**	**Mon 3/11/02**	**Fri 5/17/02**
⊞ **Development Phase**	**173 days**	**Mon 10/8/01**	**Wed 6/5/02**
⊞ **Testing Phase**	**160 days**	**Mon 10/8/01**	**Fri 5/17/02**
User Group #2	1 day	Thu 4/25/02	Thu 4/25/02
Create agenda, presentation	1 day	Wed 4/17/02	Wed 4/17/02
Create usability test (appearance, nav, tasks)	1.5 days	Fri 3/29/02	Mon 4/1/02
Send out agenda and invitation	1 day	Mon 4/8/02	Mon 4/8/02
Schedule Training rooms, model office	1 day	Mon 4/8/02	Mon 4/8/02
Perform usability tests of webhelp	1 day	Thu 4/25/02	Thu 4/25/02
⊞ **Training Phase**	**51 days**	**Mon 4/15/02**	**Mon 6/24/02**
⊞ **Implementation Phase**	**58 days**	**Mon 4/15/02**	**Wed 7/3/02**
⊞ **Add Policies Online**	**10 days**	**Mon 5/27/02**	**Fri 6/7/02**
⊞ **Future Enhancements**	**76 days**	**Mon 5/6/02**	**Mon 8/19/02**

Figure 7. 0 Summarized MASK Project Plan

Appendix E: Software and Hardware Costs

Product	Retail unit value
RoboInfo Enterprise Server	$1799.00/license
RoboInfo Enterprise Publisher	$1799.00/license
RoboHTML training	$1299/3 days
RoboInfo Enterprise Maintenance	$1699.00/year for one platinum and $899/bronze each publisher
Windows 2000 server OS with IIS, sp5	$1200.00/10 licenses
Large Site File Server (Up to 3000 users)	$29,302.00
Standard File Server (less than 1000 Users)	$14, 037.00
Small File Server (less than 100 users)	$8, 412.00
JASC PaintShop Pro	$79.00/license
Adobe Acrobat	$120.00/license
MS Visual Source Safe	$249.00/license