Big Vision, Small Steps: A KM Strategy within a US Agency's Policy Content Management Environment

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Abstract. The US Social Security Administration (SSA) provides retirement and disability benefits to about 50 million Americans. Nearly 60,000 staff members and over 14,000 state employees rely on the Agency's policies to know how to process benefits claims accurately. In the last two years, SSA has begun to improve the systems that support creation and distribution of policy and procedural content. Many of these improvements demonstrate important concepts for end user information access. Alongside this has been the recognition of a need for more sophisticated knowledge management spanning the authoring and the end-user communities. This case study discusses the developing knowledge management strategy, in light of the experiences and lessons that are being learned from the ongoing implementation of a content management environment.

1 Background

The US Social Security Administration (SSA) manages both the retirement benefits system for American workers and the benefits system to support people who have become disabled. The work is carried out in conjunction with benefits assessors within each state – it is the states that actually make the benefits decisions for disability, as the benefits are tied to other state-sponsored programs. This creates unusual information-sharing relationships.

SSA provides retirement and disability benefits to about 50 million Americans. Nearly 60,000 staff members, and over 14,000 state employees, rely on the Agency's policies to know how to process benefit claims accurately. In the last two years, SSA has begun to improve the systems that support creation and distribution of policy and procedural content. The improvements have been prompted by many factors:

- Anticipation of a dramatic rise in the number of people SSA will serve, due to the aging "baby boomer" population, as well as an increase in the public's expectations of the service to be provided [1]
- Upcoming changes in the staff profiles within the Agency, as a result of increasing retirements and other changes in the US economy and workforce [1]
- An increasing amount of policy and general instructional content being created; much of that content is being created for the SSA Intranet by operational staff, outside of the traditional policy content creation systems
- Changes in content management technologies, such as the increasing move toward web-based services and XML

The original version of this chapter was revised: The copyright line was incorrect. This has been corrected. The Erratum to this chapter is available at DOI: 10.1007/978-3-540-44836-5_33

M.A. Wimmer (Ed.): KMGov 2003, LNAI 2645, pp. 82–93, 2003.

– Commitment throughout the US government for standardization and sharing of content and public services, generally known as the e-Gov initiative [2].

The planned improvements encompass a wide range of content management activities, including moving from a document-centric to a content-centric framework, database conversion to XML, introducing the ability to trace and manage links, better tracking of change control and the authoring process, and improvement of end-user interfaces.

Some people involved in this work have recognized that the Agency needs to think more broadly about the issues that it faces, and that this thinking leads to the need for a knowledge management strategy that builds on the content management foundation. Over the course of 2002, a few interested managers, staff and consultants have been formulating ideas around Agency knowledge management. They come from backgrounds in executive management, policy content, knowledge management, IT strategy, user-centered interaction design, business analysis and modeling, and web/technology development.

What follows is a summary of the organizational needs that create the requirement for knowledge management, a brief tour of some of the content management activities currently underway, and an overview of the knowledge management approach that is being analyzed for inclusion within the content management environment.

2 The Need to Respond to Changes in Public Expectations

What is known in the US as the "baby boomer" generation – those people born between the late 1940's and the early 1960's – will increasingly be nearing retirement age. The growing number of disability benefits claims, which have a more complex and demanding process of review by SSA and state staff, exacerbates an overall increase in workload.

Claimants and their families also expect to interact with SSA and the US government as a whole in new ways. People are increasingly using the Internet to find information, complete applications, and manage their personal and financial accounts. They expect their interactions with government web sites to be simple and clear, and they expect that the information they find will be understandable to them, no matter what their literacy level or primary spoken language. They expect a higher level of integration and cross-reference between different parts of the government, for both information and services.

This combination of factors puts significant demands on the people who create and manage content within the Agency.

3 The Effect of Increasing Knowledge Worker Retirement

At the same time that there is an increasing demand on services, there is soon to be a dramatic decrease in knowledgeable staff. It is estimated that over 50% of SSA staff will become eligible for retirement over the next five years. Many subject expert specialists who are responsible for writing policy and instructions are senior, more

experienced staff, so the potential retirements within this group could be well over 50%.

Strange as it may sound, the loss of Agency knowledge may be felt less in the direct writing of policy and procedural content. The loss of experience is likely to be more subtle, more focused on changes or refinements to existing policy and to the alignment of policy with other operational requirements, and thus more difficult to address. Some people within SSA have recognized that it is increasingly difficult to find the answer to questions like "why was this written the way it was, and what will be the effect of changing it?" What is lacking within the existing content management processes is some method for finding the insights and discussions that led to the policy decisions that were then documented – i.e. the knowledge behind the content.

From the perspective of the end users of policy content, there is a rapid increase in the amount of information available to staff from a variety of sources, and yet a decreasing base of experience that can effectively filter and interpret the information they receive. Historically, it has mainly been left to individuals or working teams to "contextualize" information. This requires a high level of user experience and knowledge. Moving forward, other approaches need to be explored to help support the information consumer.

Historically, government departments and agencies have been seen as weak in their management of content and knowledge [3]. As it is becoming increasingly necessary to support the content authors and end users with a more sophisticated knowledge framework, a strategy has taken shape.

4 Overview of the Policy Content Management Environment

It has been recognized that there is a need to think holistically about content management and the systems that support content within SSA. Planning for the policy content management environment encompasses the full policy content lifecycle, including policy planning and development/authoring, change management tracking/reporting, a standard content architecture, sharing content between systems and between government agencies, user interfaces for direct access to content by the public and SSA employees, and a framework for evaluation of content use and its effectiveness. A number of projects over the past two years have led to interesting insights and some fundamental building blocks. The successes of these projects have proven certain concepts that are now being expanded into the broader improvement effort. The current project activities are described below.

The value and user satisfaction of providing information in the context of the user's job tasks has been illustrated by the recent launch of a web site that acts as a portal for users requiring Medicare and legal information as part of the appeals process following the denial of claims. The application is used by a wide variety of people, from senior judges in their 70's to junior administrators and researchers in their early 20's. The common aspect of their needs is that they do not have enough time to find the information they need to process cases when questions arise. There are hundreds of resource sites and internal instructional materials available to them, but all these resources require that they know the subject and content source in order to be successful. The application that was developed took a different approach: it asks

them a few simple questions about the case in front of them, then uses that contextual starting point to rapidly deliver relevant information.

Subject experts are increasingly interested in entering web content directly, but they require that the content editing interface needs no special technology skills or training. Pilot work in this area (as part of the Medicare project discussed above) has been successful, particularly in the application of user-centered design methods to help make the content entry application easy to use by a range of subject experts across the country. The subject experts have been able to respond promptly to user needs and to manage large amounts of new material as it moves through the content development lifecycle. This project is a step closer to the goal of more subject experts being able to be involved in a flexible and sustainable process.

It was recognized very early that managing the content development and change process was a critical feature for the growing content management environment. Initial designs for a workflow/tracking system were devised with the long-term strategy clearly in mind. The approach taken to identify and track content relies on document metadata to associate content with organizational change initiatives for better management of implementations.

The architectural thinking for the content management environment has been based on an understanding of best practices in multi-tier, web-based architecture. The goal was to outline a sustainable, standards-based architecture that would allow for growth and change in the technical environment, and also to be scalable in order to meet the needs of an increasing number of types of content being stored. The approach being developed also aims to be in alignment with overall government standards for content management, including the conversion of the underlying content into the XML format, with the ability to create links to other XML content repositories.

Throughout all software development efforts, a key part of the process has been to gain a detailed understanding of both user and organizational needs through the techniques of user-centered design (UCD), supported also by the analytical requirements techniques of the unified modeling language (UML). Significant changes are planned for all user interfaces relating to policy content. One aspect of all these design activities is, of course, the need to meet the government requirements for access by the disabled. This provides further challenges and opportunities during the design of user interfaces for content-rich, context-aware sites.

5 The Critical Importance of Metadata as a Knowledge Enabler

The future backbone of SSA's growing content management environment is a robust structure for capturing and using metadata. This metadata structure also serves as the foundation for implementing knowledge management enablers within the policy authoring and end user communities.

What do we mean by "metadata"? Our working definition is: a structured collection of data that enables any individual element of content to be categorized and described, in order to be managed and then located when required by a user or application. In practice, useful metadata falls into two categories that work together to provide an extremely rich association with the real-world contexts users face:

- **Topics**: the categorized descriptions of the real world (SSA's organizational environment) to which content relates (this might include claim types, public life events, SSA office locations, job roles, etc.)
- **Properties**: the stored data elements about the content itself as it relates to the process of creating and managing it in the electronic environment (this might include the creation date, version, author's name, when it was last updated, file format, etc.).

The important concept from a knowledge perspective is the critical need to tie content to the real world of the end user [4]. An individual's knowledge and experience is applied in the context of what he or she is doing. If knowledge and experience need to be enhanced by further information, then the method for accessing that information needs to be both efficient and relevant to the situation. Metadata is the technical facilitator for delivering that contextually relevant information [5, 6].

As described above, one current SSA web application has proved the efficacy of allowing people to access a wide range of content using context-based navigation. Work is continuing on techniques for increasing the richness of the metadata available (moving from four contextual topic dimensions to twelve or more) while at the same time simplifying the mapping of content to relevant topics throughout the content authoring process. The techniques aim to draw on, and support, content management standards such as metadata protocols (Dublin Core, SCORM, etc. [7, 8]), ontology and XML topic map definitions [9, 10], link bases, and content-focused query languages. Further work is intended to capture and analyze the patterns behind how people use the context-relevant information, in order to learn more about the specific value of content in different organizational circumstances.

Another key aspect of using metadata to support the end user is to help them see the life history of a particular item of content, and to see the relationships that it has to other items of content (via the history of its creation, the linking relationships it carries, and the aligned subject expertise of the groups involved in its creation). The insights from metadata help when interpretation of content's relevance may be required, and when unexpected circumstances occur that require a greater degree of discretion outside the scope of the content.

One of the classic knowledge management application, directories that connect people to each other and provide an opportunity to begin collaborations [11], would be enhanced by rich metadata availability. There is great value in knowing who has been involved in content creation for various topic areas, where they are now, and how they might be able to help when questions arise. This serves the dual purpose of supporting less experienced content authors, and helping more experienced people feel valued and involved, which may encourage them to delay retirement.

6 What Is the Role of a Knowledge Management Strategy?

The knowledge management strategy aims to improve SSA's ability to know what it needs to know to support its overall mission, particularly in a public environment where the needs for knowledge change over time.

The focus on a knowledge strategy provides guidance to the efforts of defining Agency metadata and developing tools to support content management, and also provides direction for the long-term creation of content. The goal is for the topics (by

which content is described throughout its life) to be directly aligned with the organization's articulation of its goals, values, and knowledge, and that the topics remain relevant to the Agency over time [12]. This allows not only the content to remain relevant, but for the ideas and decisions behind the content to be traceable. The quality of the defined topics directly affects SSA's ability to turn information into knowledge.

The ability to trace how policy evolves over time is particularly important for the future creation of policies that are not in conflict with existing policy. Tracing where policy came from and how it gets used over time helps authors and other participants during the creation process. People write more effective, relevant content when they understand both the organizational goals and the user's needs in the context of the external public environment.

The knowledge strategy is also a bridge to SSA's management information (MI). Over time, the content the people use needs to be tied directly to performance in the core mission of providing benefits to the public. The value of content is not measured in isolation, but in how effectively it supports broader work performance as represented in MI. This will become increasingly important, but potentially also more difficult to find correlation, as the Agency emphasizes "self-service" for beneficiaries. Self-service focuses on claimants and third parties using Internet forms and web applications to apply for benefits and manage their benefit accounts, without interacting with – or having the knowledgeable support of – SSA's trained field staff.

One final point about MI is that each year the Agency's goals are evaluated and targets are set for performance [13], thus placing a demand on the policy and procedural content to be kept directly relevant to evolving staff performance requirements. The creation and use of new content must be guided by the Agency goals, and existing content must be evaluated to be sure it remains in line with the Agency's direction. To regularly assess the relevance of content would be a huge – and impossible – task given the hundreds of thousands of individual items of content within SSA. The collaboration between knowledgeable people and refined, contextually aware technology begins to make this alignment with Agency performance goals more possible.

7 Knowledge Management Opportunities

Strategic guidance toward a knowledge management goal, in harmony with the development of a more robust content management environment, presents a number of opportunities to support SSA's overall service vision for 2010 [1].

7.1 Supporting How SSA Plans for Change

Two things can trigger change: external mandate (legislation, executive directive, or court judgment) or internal recognition of a need to change some aspect of service delivery to improve performance. In both cases, certain things need to be assessed and discussed that can be supported by a policy knowledge management approach.

- What will be the impact of any potential change on the ability to deliver a quality service? Can this be understood by assessing the level of change that might occur in the procedures that people follow on the job?
- How best to notify the public of pending changes, and effectively open up two-way communication as the change is being developed and implemented?
- Who should be involved in the analysis and planning activities? Who has the right mix of experience in the affected subject areas?
- How long will it take to prepare the staff, the systems, and the policy/procedural materials to implement a required change [14]? What can we learn from similar change efforts, and from other types of changes to content in this subject area?

7.2 Prompting Collaboration

Collaboration in the planning and content authoring activities requires both subject expertise and end-user contextual experience. How best to find the appropriate people to be involved in a content change process? It is valuable to have an indication of who has been involved before, what sort of role they played, and the experience they brought. It is also valuable to know who from field operations could support collaboration by providing an important user perspective, experience with the context in which policy is used, and insights into how best to communicate new policy as part of the implementation process.

7.3 Encouraging Broad-Based Communities of Practice

One outgrowth of collaboration that is increasingly important is the development of communities of practice. This is particularly true where subject matter is very complex, as is the case with assessment of disability claims, or where there are unique requirements put upon a small community, such as where state or circuit court requirements deviate from a national norm. Creation of knowledge-rich, supportive collaboration environments aims to encourage ongoing communication between participants, and the formation of communities. These communities then give value back to the organization by developing, refining and critiquing policy issues in light of real world experience [15].

7.4 Learning From an Archive of Collaborative Conversation

The concept of a “history file” goes back to the early days of paper policy documents. Such a file creates a historical reference of the drafts and dialogues associated with the creation and publication of a policy document. Increasingly, the history file has become fragmented, as parts of the authoring process are managed electronically in unstructured environments like e-mail and personal word processors, while other parts may be done face-to-face with incomplete notes and references. In future years, trying to understand the context and compromises in decisions will be extremely difficult, if not impossible. Many knowledge management and content management vendors are struggling to find solutions to this problem. Strategically, one important step is to

create a supportive environment for collaboration, discussion and content workflow that people *will actually use* [16]. This creates a further opportunity to mine that resource in the future, an activity that is expected to be made more effective by the use of the rich metadata environment that allows better understanding of the information that is available and the context in which it was created.

7.5 Understanding How Content Is Used in Order to Encourage Best Practices

Topic-based alignment between content and organizational job performance creates an opportunity to "suggest" appropriate content and support when performance problems appear. But how are performance problems identified?

Evaluating the use of web-based content is still somewhat rudimentary, although it has improved greatly in the past few years with the introduction of more effective software tools, such as for Customer Relationship Management (CRM). However, the adoption of such tools outside of the e-commerce environment, particularly in government, is hampered in part by the need to think about how to use the tools very differently for a vastly different user environment. Another challenge is to align the information gained from such tools with the behavior and interfaces of the legacy software applications that still dominate the working environment of front-line staff.

There is tremendous strategic value to be gained from recording and understanding how people use content to perform their job tasks, and to begin to identify patterns of performance among experienced people [4]. The intent is then to use these patterns to identify best practices, which then help applications use metadata to deliver relevant, proactive content to support less experienced staff. Additionally, usage and performance data helps the organization understand how people learn over time, which supports refinement of the content itself (valuable for less experienced authors) and potentially refinement of the instructional processes for new employees. This is particularly valuable in light of SSA's upcoming increase in newer, less experienced staff as a result of the wave of retirements anticipated among experienced staff.

7.6 Evaluating How Content Relates to Decisions and Performance

In the long-term, as the public and SSA staff will increasingly use more sophisticated software applications to interact with the Agency, there will begin to be an increasing refinement in the management information available to understand performance at a public, staff, and Agency level. Part of the knowledge management strategy is to encourage the alignment between Agency MI and the MI gathered on the development and use of content. The approach to creating this alignment is to build consensus on the common definitions of key indicators and performance measurement categories that reflect real world organizational performance [17]. These common indicators then become one or more of the topic dimensions of the content metadata definition (and in fact, help drive consensus for other topic definitions). Alongside the development of consistent, aligned MI repositories will be more effective reporting interfaces, to allow correlations between performance and content to be more easily interpreted.

8 Some Foci for Managing Implementation

The effectiveness of any strategy can only truly be determined in the way that it is implemented. In order to best manage implementation and development activities over the years, it is important to identify some of the barriers that are likely to arise in the environment [18]. Identification of these areas of risk allow for tactics to be developed that reduce risk. In particular, the participants in strategy development are assessing where the culture of the organization or the technology available in the marketplace may not yet be mature enough for true knowledge management. Some of the risks that have been identified are summarized below.

8.1 Human Challenges

Ownership and Involvement. As with any KM strategy, success is contingent in part on creating a culture of shared ownership and common purpose. How best to assess issues of proprietary "ownership" boundaries for the content, the metadata, the applications, and the resulting data from users that powers the knowledge technologies? The approach being taken is to engage users at every opportunity. Contrary to some of the literature [19], we are finding that hoarding information may be less of a barrier than is the limited time people have available, as the brain drain from retirement has already begun and remaining experienced staff are very stretched. However, the key facilitator for removing barriers to involvement appears to be having tools that are simple, easy to use, save time, and bring user benefits.

Encouraging and Supporting Use. Encouraging people to use technology remains a constant challenge. Will the leadership from the user-centered design community help both technology developers and content authors overcome barriers? The indications from previous projects are positive. Project teams and end users are more engaged, and producing positive results. Keeping the focus on the users is an integral part of the Agency software development lifecycle, which helps keep this in project plans. Alongside encouraging people to use technology is monitoring the risk of giving them *too much* technology – i.e. asking them to use a number of different, incompatible systems to complete their work. If the KM applications are not well integrated (or embedded) with their daily working tools, they are not likely to be well used.

Alignment with Goals. The need for organizational consensus around the alignment with goals and targets will drive the definition of metadata topics, and support the correlation of use with performance [19]. It is often challenging to align high-level organizational goals with individual and departmental job performance measures. Applications are being designed to allow categories for metrics to be managed directly by business leaders, without having to recode [18]. One approach being explored is to actively engage a range of stakeholder groups in this area, including executive strategic planners, people involved in the ongoing refinement of SSA MI and reporting standards, and managers in the field. The latter hold the responsibility of translating goals into front-line performance, and thus have a wealth of experience on successes and failures to create alignment.

Setting Information Priorities. Individuals and organizations put value judgments on the importance of information. To what degree will these affect knowledge

priorities? It appears that it will be important to continue monitoring content priorities in terms of the resulting end-user performance that supports the overall goals of the agency. Agency managers are also encouraged to focus on areas of greatest risk from knowledge loss.

Using MI Effectively. One of the key challenges is the critical need to help management use insights they gain effectively, rather than punitively. How can the educational and cultural task be supported? It is recognized that educating management on the implications of introducing new computerized tools and resources is a far longer and more complex task than training end-users. However, it is clear that helping managers use information and MI to support the cultural shift in the knowledge community is extremely important for success [19].

8.2 Technology Challenges

Creating Usable Systems. Users and stakeholders have repeatedly identified ease of use and suitability to user tasks as critical factors for success, in user focus groups, interviews and discussions. While this is not a technical challenge, per se, it becomes an important consideration for any project that falls under the knowledge management umbrella. This may affect the way project teams are made up, schedules and activities undertaken, and the nature of evaluations carried out during and after implementation.

Setting Technical Priorities. Just as there are ongoing value judgments related to content, there are priorities and budget considerations within the Agency relating to the adoption and implementation of technology. How best to keep the knowledge management activities on the organizational agenda? It remains important to identify the value of knowledge management activities to the organization. Current discussions around how to do this include identifying areas where user performance improvement can be measured, holding briefings on the KM initiative's links with Agency goals and targets, opening a dialog about KM with participants in the e-Gov initiatives, and monitoring research and publications within the KM community.

Integration. Does the organization have the capability to integrate the required KM technologies into the existing technical environment/architecture? How does this affect the priorities for implementing parts of the overall strategy? As with all large organizations, there are many "legacy" systems, processes, and collections of content. Analysis and modeling of the environment are undertaken regularly for individual projects. It has been identified that using a standard approach to this activity should help support management's ability to identify integration opportunities and barriers. Following on from an earlier point about users having to learn and use too many applications, integration planning will have to look at opportunities for reducing the number of applications (some of which are redundant) and focusing on user tasks.

Meeting the Scale of the Task. Is it possible to find good examples of implementations (in government or the private sector) that can scale to the size of this task? Among other activities, a benchmarking study was carried out in 2002 that compared aspects of SSA KM to other government and private organizations. The findings were taken into consideration as part of the process of exploring the organizational requirements for the KM strategy. It has been recognized that ongoing discussions need to be maintained with other government and commercial organizations to learn from large-scale implementations elsewhere. It has also been

important to look at modular technical approaches to allow change and migration over time, if that becomes necessary.

Alignment with Standards. To provide the greatest long-term sustainability and the ability to share with other parts of the government, the underlying tools must be based on known standards. However, are they mature enough to be implemented, and are the tools that are available commercially to support standards really "standard"? Two ongoing activities are being pursued to date: to maintain discussions with standards and government working groups, and also to approach new technologies with pilots that are tasked with assessing robustness and ability to scale up over time.

9 Conclusion

SSA has begun to address the alignment of content management activities with a growing strategy for knowledge management. Initial pilot projects are showing promise. Identifying where KM provides benefits to the Agency, and continuing to manage risks and challenges as they arise over time, creates an environment that allows the KM approach to successfully support long-term Agency and public needs.

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