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DEVELOPMENTS IN PRACTICE VIII: ENTERPRISE CONTENT MANAGEMENT

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ABSTRACT

Enterprise content management (ECM) is an integrated approach to managing all of an organization's information including paper documents, data, reports, web pages, and digital assets. ECM includes the strategies, tools, processes, and skills an organization needs to manage its information assets over their lifecycle. While many vendors would suggest that their software is a panacea, most knowledge managers recognize the greater challenge – to develop an overall ECM strategy that will ensure good information practices are in place and effectively integrated with technology where appropriate.

An effective ECM strategy should address each of the four lifecycle stages:

1. *Capture* – all activities associated with collecting content.
2. *Organize* – indexing, classifying and linking content and databases together to provide access within and across business units and functions.
3. *Process* – sifting and analyzing content in ways that inform decision-making.
4. *Maintain* – ensuring that content is kept up-to-date.

A guiding principle at all stages is flexibility. Methods of collecting, organizing, processing and maintaining content that "casts it in concrete" could become a liability in the near future.

While the top-down vision for ECM includes improved decision-making, better utilization of information and the collection of competitive intelligence, most ECM initiatives take a bottom-up approach that focuses on delivering immediate benefits through projects such as intranet portals, information searching, and web content management. However, knowledge managers also recognize that greater value can be gained from taking a more strategic approach to ECM. The research shows that those organizations that can marry effective content stewardship practices with appropriate information behaviors and values and information technology on a broader scale can have a significant effect on their organization's performance.

KEYWORDS: content management, knowledge management, practice.

I. INTRODUCTION

It is no secret that organizations have become overwhelmed by physical and virtual information artifacts. The number of paper documents, data, reports, web pages, and digital assets has literally grown exponentially in recent years causing considerable information overload. Naturally, there is no shortage of companies seeking to help solve the problem. A few years ago, electronic document management (EDM) tools for offline documents promised solutions (Kaplan, 2002b). Now, content management (CM) tools supplement EDM tools to manage web pages and embedded information artifacts. As a result, organizations are confused about what terminology and technology should be used to manage information assets over their lifecycle (Kaplan, 2002a). However, as the tools, processes and skills needed to deal with each type of enterprise information grow more and more similar, distinctions among different forms of information are becoming increasingly arcane and irrelevant. Some companies therefore use the term enterprise content management (ECM) to refer to an integrated approach to the management of all their information assets.

Regardless of the type of information and where it resides, all organizations need to create or collect, organize, analyze, maintain and archive information so that it can be accessed and used when needed. While many vendors would suggest that their software is a panacea for information overload, most knowledge managers would disagree. They understand that although technology has its place in managing information assets, it is no "silver bullet". The KM function itself arose as a result of organizations' growing awareness that information technology without good information management practices will not be effective (Marchand et al., 2000). It is therefore KM's job to help develop an overall ECM strategy that will ensure these practices are in place and effectively integrated with technology where appropriate.

To look at how organizations develop and implement ECM to manage and use their information assets better, the authors convened a focus group of practicing knowledge managers from a variety of industries. In a day-long session, each manager was asked to discuss how his/her firm is developing capabilities to do this**.** Members were asked to describe their definition of ECM briefly and the role of KM and other parts of their organization (i.e., the business units and IT) in implementing it. In addition, participants were asked to illustrate the relationship between ECM software and people, processes, and content using a specific example.

This paper combines their practices and experiences with research results from the academic literature on content management to create an overview of the issues and activities that are critical to developing and implementing an overall strategy for ECM in organizations. First, it examines the scope of the challenge facing companies (Section II). Next, in Section III, it discusses the reasons why organizations feel it is becoming important to have an ECM strategy . Then, it looks at the wide variety of activities involved in effective content stewardship (Section IV) and the key governance issues (Section V) that must be resolved. Throughout, the paper offers advice to other managers about how to begin developing an effective ECM strategy.

II. WHAT IS ENTERPRISE CONTENT MANAGEMENT?

If there's one thing that all the experts agree on, it is that no one really knows exactly what ECM really is (Gilchrist, 2001). In fact, there is considerable confusion around everything about it – what content it includes, what organizational functions are responsible for it, what activities it involves and how to accomplish it. In short, ECM is an emergent concept that managers, academics, and vendors are all trying to understand and define (Kaplan, 2002a). However, for present purposes, ECM can be defined as:

> *"the strategies, tools, processes and skills an organization needs to manage all its information assets (regardless of type) over their lifecycle."*

Current interest in ECM is due to a number of reasons:

- First, research shows that the average knowledge worker now spends about a quarter or his or her day looking for information either internally or externally (Kontzer, 2003). Anything that can reduce this effort or improve the quality of the information acquired will get corporate attention.
- Second, there is simply more content out there these days. In addition to traditional documents and data, corporate internet and intranet sites are becoming central to how enterprises do business. The Microsoft intranet site, for example, now makes 2.2 million documents available to its staff (Gilchrist, 2001). Currently, "our ability to store and communicate information has far outpaced our ability to search, retrieve and present it." (Varian and Lyman, 2000). Extranets and external sources of information often add further layers of complexity and cost to the "information soup" in which organizations find themselves (Noorlander, 2001). Images and other types of digital assets (e.g., audio, video) are another growing component of corporate content.
- Third, organizations are realizing that they could (and should) be doing much more with the content that they have. Although most are still unable to leverage their data and turn it into knowledge and results, this goal remains a strong vision for them (Davenport et al, 2001). Many companies still have significant content gaps on their internet/intranet sites which need to be filled.
- Fourth, the technology available to manage different types of content is improving and converging. Traditionally, different software was used to manage documents, web pages, and digital assets (Kaplan, 2002b). Today however, the lines of demarcation between these tools are blurring. Software, while by no means perfect, is therefore opening the door to the possibility of new organizational capabilities in ECM.

For all these reasons, many companies feel that it is time to address ECM. As a result, it is a big business – $3.5 billion in sales in 2001 which is expected to double by 2006 (Kaplan, 2002a). Many senior managers now recognize that enterprise content is central to their business' strategy (e.g., integrating processes, a single point of customer contact, e-business, competitive information). ECM truly touches virtually every aspect of an organization. Frequently, teams embark on a localized content management project and rapidly find themselves with an enterprise initiative and escalating scope, costs, and confusion (Arnold, 2003). In short, how organizations define and implement their ECM strategy could easily turn out to be the biggest challenge of the next decade (Varian and Lyman, 2000).

III. WHY DO ECM?

Focus group members were adamant that the *only* reason to do ECM was to improve outcomes. "If we cannot affect outcomes in some way, why should we bother?" asked one KM manager. Clearly, therefore, the first imperative of developing an ECM plan and strategy is to work with the people who will be using the content. "We do visioning with our lines of business," explained one member. "We want to know how they would like to see content being used." However, knowledge managers find it is often difficult to articulate the value proposition of a content management initiative, which can inhibit business support for ECM projects. To address this problem, one focus group member built a small prototype of a proposed project so that "senior management could kick the tires a bit". When they could see what they were going to get, management was much more enthusiastic and resources were soon found.

SHORT-TERM BENEFITS OF ECM

- Simplification of forms and work processes
- Ease of navigation through corporate documents and materials
- Branding
- Reduced materials cost
- Time savings
- Improved access to information
- Accuracy and currency of online information.

Most companies are taking a bottom-up approach to ECM strategy at present (i.e., one that focuses on delivering immediate benefits) because cost reduction is a top priority. While the long-term vision for ECM includes improved decision-making, better utilization of information, and the collection of competitive intelligence, these goals do not appear to be the primary drivers of most ECM initiatives in organizations today. "It's very difficult to get hard numbers for these types of uses", stated a KM manager. "We need to start slowly and develop credibility for what we can do in this area." Those companies that were successful with content management in one area found it much easier to obtain support from senior management for subsequent projects. "When they realized that there was real value to be gained from improved searching for information and better decision-making, especially in transactions, it became easier to get approvals for other content management projects," said one manager.

Most of what is actually being done with ECM today falls into one of a few types of projects:

- *Intranet Portal for Company Materials***.** This approach provides links to content needed by employees and navigation strategies to it (or through it). For example, on Microsoft's intranet, employees can take surveys, access online training, play videos or register for events. Analysis shows that two-thirds of Microsoft employees visit this site at least twice a day (Williams, 2001). The US Air Force uses a portal so its staff can access over 18,000 different types of forms, from personnel and travel requests to logistics and financial transactions. They found that this initiative helped to eliminate or simplify many forms, reduced repetitive data entry, simplified access, completion and delivery, made forms easier to archive, and facilitated approvals. When completed, savings of $9 million annually from increased productivity are anticipated. This initiative is also driving the re-engineering of data collection processes, which will result in further savings (Bednarz, 2003). Some focus group companies realized significant savings simply by making their HR policies, technical manuals, and technical specifications available on the intranet. While at first these applications may appear to be fairly mundane, the business value achieved can be significant. Time and cost savings can be realized through reduced materials cost and ease of access. A further advantage of these types of initiatives is that they support and promote the organization's brand and culture by providing a common look and feel to corporate materials. This can be particularly helpful in geographically-dispersed organizations or in firms undergoing a merger. These types of applications can also demonstrate the larger potential value of ECM and encourage senior business leaders to try other ECM initiatives.

- *Information Searching.* Staff often face significant delays accessing the information they need to do their job, which leads to time lags in knowledge-intensive work processes. Some companies are using ECM initiatives to help employees find relevant content more quickly and easily. One focus group firm created a first class resource for its researchers by integrating a variety of external sources of pharmaceutical information (e.g., articles from medical data bases, publicly available materials from other companies, special interest groups and research institutes) with internal company work processes at various stages. What made this material especially useful was a sophisticated search engine that was carefully "tuned" to identify topics of interest and good sources of information, followed by careful attention to how external and internal content should be integrated. Critical success factors were the speed of finding relevant content and its completeness and accuracy (Seeley, 2002). Another organization implemented information searching to enable front line customer service staff to access policies and practices relevant to a particular type of case. "We were able to show that each customer service representative saved fifteen minutes a day and this builds up in a customer service delivery team" explained the manager. Similarly, Ford organized a searchable collection of the company's educational assets, such as books, research, publications, web sites, training resources and links to academic institutions (Kontzer, 2003).

- *Web Content Management.* The "traditional" approach to ECM provides process controls over what content and pages appear on a company's website. It uses a combination of roles, processes, and technology to help organizations manage the work involved in developing and maintaining their internal or external website. One firm in the focus group developed a set of

processes for identifying and/or creating needed content, reviewing the material for completeness, accuracy, and legal compliance, building the necessary links to the company's information architecture, and applying the company's standard look and feel to the material (Guenther, 2001). A content review process must also be in place to make sure that currency is maintained. If the foregoing seems like a lot of work, it is. With companies averaging 77,000 pages per website (and growing), web content management is not a luxury but a survival strategy (Williams, 2001).

Today, many companies are taking a very tactical approach to their ECM efforts. There is enough "low hanging fruit" in this area to keep most KM functions busy for quite a while. However, knowledge managers also recognize that there is greater and more fundamental value to be gained from taking a more strategic approach to ECM. The research shows that those organizations that can marry effective content stewardship practices with appropriate information behaviors and values and information technology on a broader scale, can affect on their organization's performance significantly (Marchand et al., 2000). While most companies are not yet prepared to put the necessary resources behind such an effort, gaining a good sense of the scope of what is involved in a comprehensive ECM strategy is an essential first step towards achieving this vision and can even assist organizations in directing their tactical ECM efforts in a more strategic fashion.

IV. CONTENT STEWARDSHIP

The heart of ECM strategy revolves around how content stewardship practices are designed. Stewardship involves all of the activities required to manage the different forms of organizational content over their lifecycles (Figure 1). Companies approach stewardship in many different ways, depending on their goals. However, at minimum an ECM strategy should address each of the four lifecycle stages:

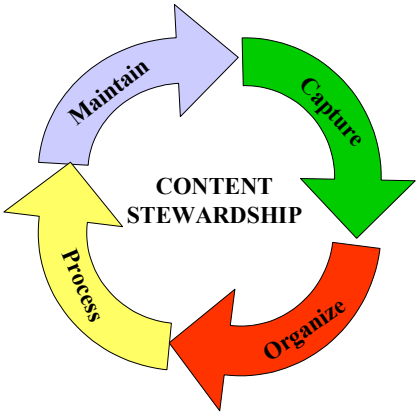

Figure 1. Content Stewardship Activities are at the Heart of ECM Strategy

1. **Capture.** Content is a key raw material for most companies. The first stage in the content lifecycle includes all activities associated with collecting content. An organization must first identify which content it wishes to capture and its range, quality, and depth (Noorlander, 2001). The results will depend on its needs and existing processes. This step will likely include learning what content is already available and in what form. It could also include buying or importing information/ knowledge from external sources such as partners or professional content providers. In addition, focus group members stressed that methods of content capture should be carefully designed. Ideally, content should require minimal or no extra effort to obtain. As developers of many knowledge repositories can attest, methods that require extra work from staff usually result in a slow decline in the amount and quality of content available. As well, many organizations find that because, in the past, little systematic attention was paid to content capture, large gaps exists between what they collect and what they need. In some cases, companies are paying for information that is no longer needed; in others, information that is needed is not available (Noorlander, 2001). All too often, content is collected because it *might* be useful rather than because it directly supports program/service delivery or decision-making.

   One focus group member outlined five levels of content capture maturity:

1. *Ad hoc.* Content is collected with no consideration to sharing, reuse or decision-making. No heed is given to what should be collected and the impact on those who collect or provide it.

2. *Considered.* Some thought is given to what content should be collected and how to collect it. The focus is on internal sharing and reuse.

3. *Planned.* Content capture is planned and undertaken efficiently and effectively. Opportunities for sharing and reuse are identified internally and externally, so that duplication of capture is avoided.

4. *Formal.* The organization uses a set of principles, policies and standards for capture that optimizes sharing and reuse and reduces duplication. These principles are widely known throughout the organization.

5. *Pervasive.* Principles, policies, and standards for capture are embedded in the organization's thinking. The enterprise continuously seeks to improve its capture practices in conjunction with its stakeholders.

While today, most attention is paid to capturing content in order to facilitate current work, in the near future, content collection will also include business intelligence gathering. This different class of activity involves detecting and identifying important economic, social, and political changes, competitive innovations that might affect a business, market shifts, changing customer demands for new products, and potential problems with suppliers and partners (Marchand et al., 2000). Such information will come from a much wider range of information sources than at present -- ranging from external data bases to a company's existing transaction information. In addition, it is likely that this type of knowledge will require further contextual information and real-time information capture.

2. *Organize.* A great deal of attention is currently being paid to this step of the lifecycle because IT can provide considerable support with it. Clearly, content is useless if it cannot be easily searched or navigated. Therefore, organizing content involves indexing, classifying, and linking content and databases together to provide access within and across business units and functions (Marchand et al., 2000). Ideally, content organization should involve *both* humans and technology to optimize the strengths of each. While technology can usually get the process started well, people can provide more accurate and richer approaches to categorization and are therefore an important component of content organization. Furthermore, many software solutions find it difficult to handle the wide variety of items companies wish to manage, e.g., structured and unstructured materials varying in length, purpose, type, writing style, and vocabulary. Therefore, humans must make decisions regarding these types of issues (Meyers, 2002).

   Four steps in organizing are:

   - a taxonomy,
   - metadata,
   - work processes, and
   - look and feel.

   Organizing content begins with a taxonomy, that is, a systematic categorization of content by keyword or term (Corcoran, 2002). While librarians have utilized taxonomies for a long time, using them to structure content at an enterprise or inter-enterprise level is relatively new. Properly implemented, taxonomies can become "the common language that can be shared across the organization, furthering the goals of knowledge management" (Corcoran, 2002). At its best, a taxonomy provides an organizing framework for content and facilitates access for users.

A second layer of organization is metadata, that is, information about content and where it is. Metadata provides a roadmap to content, much as a card catalogue points to the location and information about a book (Lee et al., 2001) Metadata is especially important for workflow design, the overall management of content, and for content exchange between enterprises or different software applications. Unfortunately, a lack of metadata standards inhibits the development and use of this critical layer of content organization (Lee et al., 2001).

A third layer of organization is provided by work processes. These processes identify the content's ownership and ensure that content meets all necessary corporate, legal and linguistic standards. They also manage such activities as authorship (which can be separate from ownership), versioning, and access.

A final component of organization involves the look and feel of content. Decisions must be made about how internet and intranet content is displayed. Many organizations use standard templates for documents and other information assets. Since increasingly organizations are "webifying" their systems to enable ease of navigation and flexibility of platforms, standardization means that it is highly desirable that all content – however it is accessed or stored, be presented in a common way.

3. *Process.* The third step in the content management lifecycle is the most frequently omitted. The processing step sifts and analyzes content in ways that inform decision-making. Very few firms have yet developed the capability to aggregate, analyze, and use content to make informed decisions that will lead to action and generate business value. "In the rush to use computers for all transactions, most organizations have neglected the most important step… the human realm of analyzing and interpreting data and acting on the insights." (Davenport et al., 2001). A recent study showed that less than 10% of companies are analyzing any type of transaction data for decision-making. It found that most present day analysis is typically ad hoc and therefore difficult to repeat (Davenport et al., 2001). Skandia Group is one of the few companies that have managed to develop its processing capabilities further. This firm made it a strategic priority to turn human capital, i.e., the knowledge, skill and experience of employees, into structural capital, i.e., its manifestation into systems, processes, and customer relationships (Figure 2) (Kettinger et al., 2003).

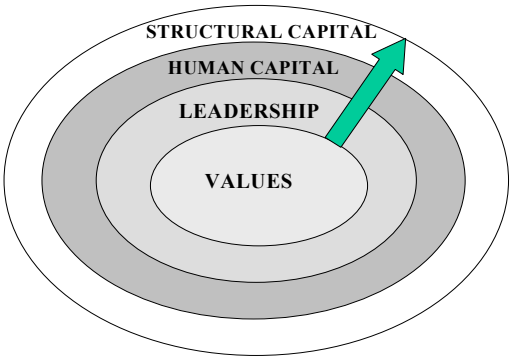

Figure 2. With an ECM Strategy, Structural Capital can be Grown out of Human Capital

Hiring and training people with analytic skills is a critical part of driving value from content. Five key competencies for organizations that want to improve their content processing capabilities are (Davenport et al., 2001):

A. *Technology skills* – an understanding of the software and systems needed to extract, manipulate and analyze data.

B. *Statistical modeling and analytic skills.*

C. *Knowledge of the data* – much of this knowledge is tacit, changeable, and idiosyncratic.

D. *Knowledge of the business* – an understanding of the context of an industry and the business issues decision-makers are concerned with.

E. *Communication and partnering* – the ability to communicate findings to decision-makers in ways that will encourage their use.

4. *Maintain.* Content maintenance is by far the biggest headache that most knowledge managers face with ECM. While it is a challenge to collect, organize and process content, it requires considerable ongoing effort to ensure that it is kept up-to-date. None of the focus group members saw content maintenance *per se* as their responsibility. However, they all recognized that KM has an important role to play in keeping content current. "We guarantee currency" stated one manager. "Our credibility is based on this." His group therefore has a formal system of content "expiry dates" and reminders are sent to content owners and authors to ensure that information is reviewed and updated appropriately. "If they don't do it, we remove the content", the manager said. "We'd rather have no content than inaccurate content." Another focus group company invested a considerable amount of time and money in developing a very high quality intranet site but neglected to put the same effort into the site's ongoing content maintenance. As a result, utilization quickly dropped from 80% to 20% of users because the company had "a beautiful shopping center with nothing to buy."

   More than any other part of the lifecycle, maintenance surfaces the true costs involved in content management. "Many companies… have no idea… of how much information they use. They do not know where it is used, the suppliers, or its value. They almost never know how much their information supply chain costs them." (Noorlander, 2001). While using technology can achieve some savings, humans play an important role in content maintenance because they must continually assess how well an organization's content is working to meet its needs and these are always changing (Meyers, 2002; Arnold, 2003). ECM is a dynamic field and is still fairly labor-intensive. A survey of eight companies working in this area concluded that an over-reliance on software solutions is dangerous and that companies must be prepared to invest significant human resources in building and maintaining their ECM solutions (Gilchrist, 2001).

   A final element of this lifecycle phase is establishing principles and standards for content retention and preservation and for its disposal. As ECM grows to become a corporate strategy for managing all forms of content, this issue will become an increasingly complex challenge. Today, organizations are often overwhelmed with paper and microfilmed documents. As these are digitized and other types of assets are added to the mix, the costs of retaining and protecting them will continue to rise, unless practices are put in place to manage their retention and disposition.

A key guiding principle at all stages of content stewardship must be flexibility. Not only does flexibility aid navigation and support the multi-portal strategy that many companies are adopting, it also supports sense-making activities. In today's fast-paced and highly competitive marketplace, any methods of collecting, organizing, processing and maintaining content that "casts it in concrete" could become a liability in the near future. Flexibility is key to organizational responsiveness. The President of IBM, Sam Palmisano, predicts that companies will soon need real time information to respond with speed to changes in customer demand, market opportunities, and external threats (Anon., 2003). Real time response will place increasing pressure on enterprises to manage all phases of the content lifecycle in a much more dynamic fashion than they have been doing to date (Arnold, 2003). It is also a warning for knowledge and IT managers to be extremely thoughtful in how they design ECM processes and select technologies. As one focus group member explained, "We must be able to create and/or collect content once, reuse it in many different ways and in many different formats and help people make sense of it".

V.GOVERNANCE OF ECM

ECM tends to overlap both IT and knowledge management (KM). Initially, therefore the focus group became bogged down in a complex discussion of roles and responsibilities for ECM that was highly

specific to each individual organization. It soon became obvious that there is no "best" structure and governance solution for this function. While some organizations distinguish between "information" and "knowledge" in dividing responsibility between IT and KM, this distinction is becoming just as unclear as the division between internet/intranet content, documents and digital assets, and the division between structured and unstructured content (Guenther, 2001; Wilkoff, 2002; Kaplan, 2002b).

While it is unlikely that an effective ECM strategy could be realized without using technology to some degree, many feel that KM is clearly in the better position to develop an overall ECM strategy, which could unify both infrastructure and tactical initiatives. "The benefits of content management can … be fully realized only as part of an overall knowledge management strategy. Any attempt to implement it in isolation is likely to produce a very poor return on investment" (Newing, 2002). Not all focus group members agreed with this assessment. Some of their organizations divided responsibility for ECM according to the type of content (e.g., structured content being the responsibility of IT and unstructured content the responsibility of KM, or explicit knowledge but not documents or records). Some are not yet at the point where they have an overall ECM strategy. However, all participants recognized that no KM group can make ECM successful on its own. Clearly, business units, KM and IT are each important contributors to ECM and ECM is a multi-disciplinary function that requires considerable teamwork to be effective.

Focus group members were in much greater agreement about *what* needs to be done and what *roles* need to be filled to create effective ECM. *How* these functions and roles are divided may vary by organization but each of them is important to successful ECM. The group identified several ECM roles and responsibilities:

- *Individual content quality, accuracy and timeliness.* Each piece of content must have an owner who is ultimately accountable for ensuring that it meets the organization's needs and complies with all company policies and legal conditions. Owners should be aware of the business' strategy pertaining to the content and its potential uses. Focus group members suggested adding content ownership accountability to individual managers' annual reviews to ensure that this responsibility receives adequate attention.

- *Individual content authorship.* Content must be prepared or acquired by someone who understands it and its potential uses and limitations in an in-depth fashion. It must also be maintained on a regular basis.

- *Overall content quality, accuracy and timeliness.* Owners of business content often do not understand that there is also a higher level of responsibility for content. This role manages how content as a whole is stored, protected and backed up as well as the procedures for version control and content validation.

- *Content stewardship.* The focus group stressed that one or more content stewards should be continually assessing what the organization is doing with its content, considering how existing content could be repurposed, and how additional value could be added by increasing contents' applicability and transferability. Some group should be given overall responsibility for managing the content lifecycle.

- *Taxonomy and metadata.* Clearly, this specialized activity must be undertaken by someone with a sound knowledge of the organization's information architecture. Yet, this responsibility should not be undertaken in isolation from other elements of ECM. Research is showing that an organization's knowledge-making capabilities grow from an evolving relationship between those who know the data and those who make decisions. Since taxonomy is integral to knowing data, it can be a key part of determining how to "grow" knowledge from data (Davenport et al., 2001). Others point out that a taxonomy should never be considered finished. "It is a dynamic document that evolves over time. Building the perfect exhaustive taxonomy is not only futile but

counterproductive to the business." (Corcoran, 2002). Thus, it is dangerous to allow the taxonomy role to drift too far away from other, more practical content stewardship activities.

- *Workflow management.* Technology to control the whole lifecycle of content is almost essential. However, as with any other form of technology, such software must be carefully selected (or designed) and implemented. Today's marketplace is cluttered with vendors all claiming to provide ECM software. At present, because of the very fluid nature of ECM, vendors are operating under the maxim, "Make sales. We'll figure out the software later." (Arnold, 2003). This attitude makes it even more critical for organizations to understand clearly what they need from technology before they invest in it.

- *Access management --security and privacy.* While most workflow management tools provide technical support for different levels of access management, it is up to the organization to determine its values and behaviors surrounding content. Some, e.g., Skandia, opt for as much transparency as possible (Kettinger et al., 2003). For others, transparency is not possible because of their culture or business needs. While security and privacy are often the first thing to come to mind when access is discussed, many knowledge managers suggest that it is a bigger challenge to encourage people to share (Smith and McKeen, 2000). Knowledge managers frequently disagree with others in their organization about access. "Our management tends to want to restrict access quite broadly if I'd let them. I always tell them that the default is complete access unless they tell me otherwise" said one focus group manager. Someone must therefore pay attention to both how and where content should be restricted and shared. Levels of access could include: publicly available, available to partners or officers, available within the organization, or restricted to certain roles and functions.

- *Technical support.* Many technical options are available to help organizations deal with content, e.g., data bases, data warehouses, search engines. However, how these options are implemented is a business issue and business needs should be carefully considered before an option is selected. Different technologies impose certain restrictions on users that must be evaluated. Data warehouses, for example, can be designed in ways that severely limit how data can be viewed. Web search engines can be configured to be broader or narrower in scope. Managers should be aware that even the best technical solutions will likely need a considerable amount of human analysis and change management to be effective.

- *Content standards and templates, look and feel.* As content proliferates, standards can help prevent information anarchy. For example, many companies have developed standards for portals. "Initially, we let people develop their own portals. It was chaos and took three times as long and cost five times as much to find something. Now KM provides a standard framework for everyone to use", said one focus group member. Members stressed that content presentation is a specialized job that shouldn't be left to individual business users. Optimal solutions should take both organizational and functional needs into consideration.

- *ECM strategy.* Most companies are not ready to develop and implement a comprehensive ECM strategy, although they recognize the need is there. Only one focus group member proposed creating such a strategy but he could not obtain any funding for it. Nevertheless, taking time to address the broader strategic implications of any specific ECM initiatives is highly desirable and will generate more value in the long term (Davenport et al. 2001). Some companies established steering committees to ensure that ECM initiatives are developing synchronously with their company's business and technical strategies.

- *Communication about ECM.* The focus group stressed that people must know what the organization's standards and practices are around content. Training in content management processes is usually also required. Finally, as noted above, effective ECM must be associated with an emphasis on supportive information behaviors and values, e.g., sharing, transparency (Marchand et al., 2000).

VI. CONCLUSION

Enterprise content management is on the "bleeding edge" of knowledge management today. While many companies envision their information assets being well-organized, easily accessible, and facilitating decision-making at some nebulous point in the future, the current reality is considerable less rosy. Organizations have only begun to grapple with what is involved with ECM. At present, there is no clear definition of what it means, how it should be done and who should do it. This paper takes a first attempt at pulling together the experiences and advice of practicing knowledge managers and experts to begin to clarify these themes. Its objective is not to provide definitive answers to the challenges of ECM but to establish the scope of the issue and the questions that need to be asked in organizations if the vision of ECM is going to be realized. These questions will be increasingly confronting all types of organizations coping with the growth of all forms of content. Some will manage to develop the necessary skills to derive value from their content, while others will find it too difficult. However, as organizations become more and more knowledge-based in their endeavors, it is likely that their ECM capabilities will become a significant differentiating factor between those that succeed and those that fail.

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