Effective Content Organization Of A Portal

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ABSTRACT:

Portals are very commonly used platforms that address many needs. This paper provides a unique method of organizing portal pages and therefore enabling accessibility of the information and knowledge provided in the portal. The portal is the main platform for knowledge management solutions and for content *rich* applications; accessibility has been found to be a critical factor for portal use and business success. The method reported is based on organization by context rather than by knowledge format. Relating the context to processes of work and main users' needs, as defined by *field* users, yields high-level portal usability and therefore to effectively built portals.

Keywords: *Knowledge management, Portal, Content organization*

The Portal Platform

Portals are very commonly used platforms that address many needs. The Portal, in its initial meaning, is "a grand and imposing entrance (often extended metaphorically)" (Dalkir, 2005; p 340). The term portal today is indeed used metaphorically. The portal is a workplace, enabling effective consolidation of data, information and knowledge. As people struggle today in the overwhelming environment of information and information systems representing data, the portal serves as an organizer, easing the process of reaching the right content at the right time. The term is used sometimes as is, however sometimes is defined as "the enterprise portal" or "the knowledge portal" distinguishing it from the Internet based portal: Neuman, et al. (2005; p 475) state: "Enterprise portals help to increase overall efficiency and business needs with an online presence. They enable the sharing of information within, and outside of, an organization. They maintain, organize, analyze, and disseminate information and provide a means for integrating systems that are used within the enterprise. They help to manage business knowledge content, present information in a personalized manner to the user whilst providing a common user interface." In knowledge management, portals serve as the main platform on which most KM solutions are based.

Collins (2003) and Firestone (2003), quoted by Dalkir (2005; p 234), explain the nature of the portal: "Knowledge portals provide access to diverse enterprise content, communities, expertise, and internal and external services and information." Dalkir (2003; p 234-235) continues and elaborates on the portal's essence: "The purpose of a portal is to aggregate content from a variety of sources into a one-stop shop for relevant content. Portals enable the organization to access internal and external

knowledge that can be consolidated, analyzed, and used as inputs to decision making…
Knowledge portals link people, processes, and valuable knowledge content and
provide the organizational glue or common thread that serves to support knowledge
workers."

Kotorov and Hsu (2001; p 86) explain the critical nature of the portal in the
Knowledge Management context: "If we state it metaphorically, knowledge
management portal technology holds the promise of being the brain of the organization
(Nelson & Winter 1982) that provides its employees with vital information (Kotorov
2001) for success in the hypercompetitive market place, which in turn secures the
survival of the organization."

The Accessibility Challenge

Many portals and websites are content rich. There is no accurate definition for the term
"content rich". Many websites on the Internet serve as marketing and sales enablers;
others, as collaborative sites, connecting people with shared interests. Both types may
or may not be defined as content rich, depending on the amount of pages they include.
If the normative user can easily reach all content on site, no matter how it is organized
and what search engine is supplied, and find requested information, we will not define
it as "content rich". If accessibility depends on organization and/or on other search
mechanisms, the portal or website are defined: content rich. It does not matter whether
the portal enables access to information and knowledge stored on it or if the
information and knowledge displayed are stored elsewhere and only reflected via the
portal. Content rich depends on the result. Neuman et al. (2005; p 472) affirm: "Web
portals, as content aggregators, provide efficient access to information and services
online: they are electronic gateways or entrances that provide hypertext links to other
sites and collect information. They provide a focal point and an information source that
can be personalized, allowing people to gather detailed information, on demand. Web
portals play an increasingly important role amongst online communities as audiences
seek out more specific information, providing valuable opportunities." Accessibility is
so important that it is addressed in one of the three questions to be answered on the
portal mission statement: "Who will the portal serve? What information or services
will the portal provide? And - How will the information be delivered?" (Augustyniak
et al, 2005a; p 287). Furthermore, Augustyniak et al (2005b; p 643) state: "Content
management is the keystone of a portal. The components of a portal CM strategy
include the content inventory and analysis, content acquisition, access structures,
classifying content, content life cycle, CM software, and metadata standards."

Accessibility is one of the main factors of usability. Usability is defined as a criterion
in portal quality models. "The portal must provide a simple and intuitive navigation for
users" (Moraga, Calero & Piattini 2006; p 557); Criteria include: "Usability: content
layout and classification, website structure, etc. " (Moraga, Calero & Piattini 2006; p
559).

Augustyniak et al (2005b; p 643) claim:"The success or failure of a portal is directly
linked to the effectiveness of its CM strategy. Due to the explosion of available
information via the web, the challenge for the IP who is developing a portal is not

acquiring and storing voluminous amounts of content from various sources, but instead organising the information so that it can be delivered in a customised, personalised format. The goal of the portal is to provide end-users access to highly relevant data from a myriad of sources, simultaneously and in real-time."

High level accessibility, however, is not as easy as might be anticipated. Too many portals are built, yet usage level is low. Of course, some portals' low usage level may result from poor content, irrelevant content for the user. Accessibility may be perfect, but if the content reached is not of benefit to the user, he or she will not come back. Nevertheless, many content rich portals and websites do include necessary content but fail elsewhere. "The success or failure of a portal is directly linked to the effectiveness of its CM strategy. Due to the explosion of available information via the web, the challenge for the IP who is developing a portal is not acquiring and storing voluminous amounts of content from various sources, but instead organising the information so that it can be delivered in a customised, personalised format. The goal of the portal is to provide end-users access to highly relevant data from a myriad of sources, simultaneously and in real-time" (Augustyniak et al, 2005b; p 643). "The portal will only provide as much value as the accessibility of its content" (Augustyniak et al 2005b; p 644). The present situation is not optimal: "Current web technologies are seriously limited in making distributed information accessible for users in an efficient manner" (Neuman et al. 2005; p 475). Cousins (2006; p 434) agrees: "Portals are not great user experiences." An overflow of information is almost as deficient as a lack of information, because the bottom line is the same: The user does not arrive at the required information and knowledge. Calabrese and Orlando (2006; p 250) coined the term: "Three clicks to content." The difference between three clicks and five clicks is the difference between use and no-use. Accessibility is critical.

By emphasizing on accessibility, we do not omit other causes. The list is long. However, poor content (described above) and poor accessibility are the main ones.

From Accessibility To Organization Design And Classification

Our target is to "get people today and tomorrow directly to the information they need" (Powers 2004; p 16). How is accessibility reached? By access structures as defined by Boiko (2002; p 651): "Access structures are the means of organizing content in order to find it easily and reliably." Boiko elaborates on the need of access structures. This hypothesis must be clarified. We all experience accessibility using several methods: accessing information via a search engine; accessing information via navigational menus; accessing information via maps (site maps, conceptual maps or geographical maps); and, accessing information via hyperlinks (termed as associative navigation). Boiko's statement is not intuitive, as many times, we tend to think, that supplying a search engine as the access method is satisfying, and further organization is not required.

Access is achieved through organization design- the proposed navigation structure - and through classification of specific documents, according to the structure designed. Using a search engine as the main or only access structure is insufficient (Kotorov & Hsu 2001); multi-channels must exist. Snowden (2007) discusses the multi-channel as

gate to information and knowledge in terms of different tools, leading to knowledge sharing, but the multi-channel-to-knowledge is a need also within the portal boundaries. Resources of planning and implementation need to be focused on optimal organization design and easy classification.

Common Organization Design – The Supplier Attitude

"As with any system-development initiative, the time and energy spent in the planning process is reflected in the success or failure of the end product. Portal development is a complex and costly endeavor that requires meticulous planning and design" (Augustyniak et al, 2005a; p 283).

When discussing content organization, the navigational tree features prominently. The navigational tree is the menu, structured hierarchically, and pointing to the content through sub-menus called "branches." "Leaves" are the last level menus, pointing to the content itself. When designing navigational trees, we usually use a set of "good" navigational guidelines. Boiko in his book "The Content Management Bible" (2002) defines, in detail, how navigational organization is to take place. The major guidelines for defining navigational trees include the following:

- Balanced navigational trees (depth and breadth): No one broad branch, and all others very narrow, etc,

- Depth: Three clicks to information. However, this number can vary depending on the portal in which it is located. In portals and websites, characterized by low motivation of the user, the number of clicks to information should be even lower (one to two clicks); just as, while searching in Google, or any other public search engine, results are usually scanned only on first page. In portals and websites, where we assume higher motivation (one searching in his own personal folders on his computer), the depth (defining number of clicks to information) can be higher.

- Breadth: Lists presented within one page, with no or minimal scrolling. The recommended number of items in the menu is also limited. No magic one unified number exists: Some speak of seven, other limit to twelve. The rational for choosing the maximal number, is based on the logic in which the list of items are organized by. If the list, for example, is a list of countries, organized by Alphabetical order, the user knows, also when he or she are on the beginning of the list, what is further expected, and therefore, a longer list (higher breadth) is acceptable. In other cases, the limit is based on the ability of the user to scan the list in one glance. Significant to this ability are both content parameters (as explained above) and also graphical parameters (as font type and size).

- Content: Consistent values within sets in the same tree level (i.e. 1, 2, 3, 4 and not 1, 2, a, 3). No matter how long or short lists are defined, in order to ease accessibility, the items on the list must be consistent. On a list of electronic appliances of a company, there is no place for one or two furniture items. Even though no titles exist (at least on the first level of the tree), the user, attaches a

title in his mind. This attachment eases understanding the list, and improves accessibility.

In the past six years, over 20 portals and content-rich websites, mostly serving within organizations, were examined by the author. Most of the above-described guidelines were applied, yet the organization of portals and content rich websites seemed far from optimal as users found it difficult to find predefined content in the sites (see the "accessibility challenge" paragraph above). It is not that that these guidelines are incorrect; they are simply not sufficient.

In many cases, the information and knowledge were organized according to the suppliers' perspective, by those employees in charge of updating the information. The suppliers (also termed- providers) are also the most natural group to be assisted by while planning the navigational tree. On the process of portal needs analysis, it is easiest to interview the information and knowledge providers, who serve, in most cases, as the content experts. The "supplier attitude" is recognized in the literature, as for example in Frappaolo (2006; p 66): "The party that is best equipped to organize or classify knowledge is the knowledge provider (he or she who has a clearer perspective and understanding of the knowledge, and can thus separate the wheat from the chaff). However the knowledge provider frequently does not understand the precise knowledge requirements of the knowledge seeker, nor the specific context in which the knowledge seeker plans to apply the knowledge." What seems easy, natural, and most common, does not turn to be optimal at all.

Organizing The Contents In The Users' Perspective

In order to properly design accessible portals or content rich websites, organization must reflect the users' perspective: "We believe that a discussion about knowledge in organizations will be incomplete without commenting on the subject from a knowledge worker's perspective, though this lens is infrequently used. More often, knowledge management is approached from an organizational level of analysis, often without regard for the end user" (Prusak & Weiss 2007; p 37).

This is not trivial, as analyzing the needs of any portal or content rich website is usually carried out together with knowledge providers - the suppliers. Even when users are questioned in the first stages as to their needs, the process of deepening and collecting the content is performed by the suppliers. Because they are providing content, it is all too easy to organize the contents though their lens. Indeed, it seems simpler, when organizing contents according to suppliers, to maintain and govern the various content areas, each overseen by a knowledge provider. The first step is to recognize the importance of the users' perspective, and to be aware, while designing the portal, of the "supplier attitude" trap. The different attitude can be emphasized from the following example: I was asked to review a portal of a large food retailer. The portal was designed for the stores, and the main users were to be the supermarkets' managers. The navigation tree included the right breadth and depth, was balanced and consistent. However, it was designed guided by the suppliers' attitude. An extreme example was the sub-menu, which served as the gate to computer application systems. It was defined via the suppliers' attitude, in this case, computing systems' managers (IT

staff). It included two items: a) Application systems; and- b) Data warehouse systems. Indeed, this definition is precise. However, the supermarket's manager, now weighing possibilities regarding enhanced orders for a coming holiday, where shall he seek last years orders information: On the first item of "application systems", or on the second of "data warehouse systems". Every IT (information technology) person will probably know that the "data warehouse systems" is more likely to include an answer to his question; very few supermarket managers would have a clue where to start. Organizing the information regarding to "orders", "inventory", etc., would serve better in terms of the main defined users.

Common Organization Design – Format Structure

One of the most common ways examined, for organizing navigational trees in portals, is by the format of the content. Information and documented knowledge may exist in many formats, including:

- Working documents: Daily produced/used information. i.e.: work plans.

- Regulations and procedures of work: Controlled guiding information.

- Industry standards (sometimes separated from the organizational regulations, as they are external)

- Templates;

- Forms;

- FAQ's: Frequently Asked Questions (including, also the answers);

- Discussion groups (forums);

- Presentations.

It is well understood, why portal planners tend to plan navigational trees according to information and knowledge format: It is easy. This is definitely a well-defined structure with no contradictions between menu items, and is easy for the knowledge providers to maintain. This reminds the first years, when organizations started using personal computers and networks. A common structure of the directories would include:

- Word documents;

- PowerPoint presentations;

- Excel spreadsheets.

As easy as this structure may seem, it serves well, only if the user knows what information he or she are exactly looking for. In other cases, it may be useless.

In order to facilitate accessibility for the user, a different approach is recommended.

Organizing The Contents In The Context Of Business Processes

Noorani & Kodandarama (2007; p 747) write about sales portals: "Several CPG companies have set up sales portals, but not been able to effectively use it as they have not been able to streamline the process making it transparent to all the channel partners involved."

In his book "Knowledge Management in Theory and practice", Dalkir (2005; p 12-18) describes the history of knowledge management and its milestones. He speaks about three generations of Knowledge Management: "The third stage of KM brought about an awareness of the importance of shared context: how to describe and organize content so that intended end users are aware it exists and can easily access and apply this content. Shared context creates shared meaning. Content needs to be abstracted from context".

The challenge lies in classifying the knowledge and information in paths that will ease usage while performing the job. The suggested approach is organization by business processes.

"Integration with business processes is a relatively new development, and should be added to the legacy functionality that already constituted a portal-personalization, search and collaboration" (Harney 2005; p 10).

"What aids transfer (of knowledge- m.l.)? It also helps if the source is conveying knowledge about a situation akin to the one to which the knowledge will be applied" (Leonard, 2007; p 61-62).

Organization by context of business processes has the potential to improve accessibility radically: It brings the information and knowledge closer to the user, by defining navigational trees by the business processes in which the user will employ it.

In the case of uniform business processes that can be well defined, the names of the processes themselves is the preferred recommendation for the navigation branch names. For example, in a safety portal - lifting, working with dangerous materials, etc; in a marketing portal - participating in conferences, PR, telemarketing, promotion, etc. However, if this is not applicable, business content subject areas, as close as possible to business processes, will serve as the tree navigator structure. i.e. in the case of a safety portal: fire, electricity, dangerous materials, etc.

The information and knowledge may still be maintained by its format, if it is easier for the provider to maintain it as such: i.e., by forms, procedures of works, good practices, industry standards etc. These format containers will be defined as the *building blocks* of the portal. The building blocks, however, will <u>not</u> serve as part of the main navigational tree. The tree will be defined by the business processes, each page containing elements of several formats, i.e., documents, law precedents, frequently asked questions, etc.. When adding new content, however, the knowledge provider will store it regarding to its format, but will be also asked to classify the item by the

business process it serves (by tags or any other agreed categorization method). These business processes, organized in a unified structure, will comprise exactly the navigation tree by which the knowledge and information is to be presented. For example, in the safety portal, one of the dozen plus portals the author has constructed using this methodology (for Teva Ltd. The largest generic pharmaceutical company worldwide), the knowledge and information was organized in the portal as follows (using ORACLE BEA Aqualogic, also known as Plumtree platform).

The information was stored in the following lists and file folders:

- Content experts

- Working documents

- Discussion groups

- Frequently Asked Questions (FAQ's)

- Useful links

- Additionally, a "standards" (regulations) knowledgebase is handled as an external knowledgebase with an updated version loaded monthly.

- The navigation tree is flat (no hierarchy is needed in this case) and includes the following main business subjects:

- Accidents & Incidents

- Hazardous Materials

- Industrial Hygiene

- Audits

- PPE

- Maintenance

- Risk Management

- Work Plans

Every page accessed fits one of the businesses subjects and includes at least six portlets (small windows). The portlets are homogeneous. Each portlet is a reflection of one of the file folders or lists described above, i.e. content experts, working documents, etc.. The standards knowledgebase contents serves as the sixth portlet. The structure is unified, however, the content is mainly different; each portlet is rather filtered to present only the information and knowledge items classified as relevant to the specific

business subject described. Therefore, a content expert tagged as expert for hazardous materials will be listed only in this page, and a question in a discussion group (forum) dealing with risk management and audits, will be reflected automatically, in the relevant pages.

Standards are connected as an independent knowledgebase, as the knowledgebase includes the Israeli standards, as received every month, updated. Its contents is reflected again, in all pages, filtered regarding to the relevant information. This reflection is obtained with no tagging, as the knowledgebase is external; furthermore, the knowledgebase is frequently updated. Relevancy of content, for each page, and each specific business subject, is achieved by automatically running search queries on the knowledgebase. In each page, the relevant search query was defined, using keywords defining the relevant standards for the process or subject.

One of the challenges, often experienced in many organizations, regards to information that no one accesses. i.e., even if a portal is in use, people will hardly access the standards and use them. The described method results in having two to five specific, focus, standards, on each page, relevant exactly to the business subject dealt. The chances that the user, who is not sure about some standard, will open it and examine it are greater, for two reasons:

1. The user will rarely deliberately open the standards knowledgebase. It is more likely that he or she search for an existing document, or an expert knowing the answer. This technique, serves in a "push" mode, as the standards knowledgebase is included on the same page, as more common used portlets.

2. The user, observing the standards knowledgebase portlet, is not overloaded with a long list of standards. Only standards, relevant to the specific business subject, are presented.

As part of the page definition, in addition to the six portlet, described above, each page may also include specific portlets, relevant only to the accessed page, i.e. safety indicators in the Accidents & Incidents page.

In addition to the main navigation tree, organized by business subjects, another orthogonal menu exists, enabling access to all standards, all discussion groups, all training materials and other information and data items that in some cases may be accessed horizontally (comparing the vertical daily access by business subject).

This way, the user has more than one gate to knowledge and information: Working on some business subject, he or she may access all relevant content regarding the subject; when knowing what is requested, the classic "format based" menu can be used.

The above describe a safety portal of Teva; in other organizations, similar portal organization methodology was also adopted for different content worlds, i.e. Organizational Portals, a purchasing portal, a customer management portal, a R&D portal, etc.. The method was implemented using different technology platforms, such as SAP Portal, IBM WebSphere and Microsoft SharePoint. In many cases, business

processes were used instead of business subjects. In most cases the business processes were not a flat list, but rather a structured 2-3 level tree. Knowledge and Information were usually represented in recurring folders and lists (viewing all organizations and content worlds) including:

♦ Good Practices / tips

♦ E-learning and training objects

♦ Forms

♦ FAQ's

♦ Standards and working procedures, etc.

In most cases, not all portlets were included in all pages, describing the business process. Every page included 50%-80% of the portlets, always the specific portlets relevant to the process or subject. Two levels of focusing exist in these cases: The right formats of information knowledge, relevant to the process or subject, and, the right content within these formats.

One finding is shared by users from all organizations and populations:, when questioned, they described the portal with superlatives such as intuitive, easy to navigate, accessible etc. Dozens of users were questioned, and not even one has claimed that s/he could not find requested materials.

In all cases, the portals were not built as an advancement of otherwise-defined portals. Therefore, no findings as to the level of improvement can be included in this research.

Effective Classification Of The Content

In order to enable eased access, users retrieved information and knowledge according to business processes or subjects. However, saving the information and storing it, is easier for the knowledge provider by format (regulation, form, tip, etc.). We may assume a conflict between the ease of the users, and the ease of the providers, as the user will find the knowledge and information accessible by business context. The described model offers a solution: The information and knowledge are saved in lists and file folders, by their format. Regulations will be all saved in one folder; the list of content experts in another. In this manner, the information and knowledge may be saved easily; furthermore: each knowledge format is saved regarding its characteristics: regulations are saved with version numbers; working document without; Content experts are saved as contact lists with communication channels (telephone number, email, etc.)

While defining the file folders and lists, 2-3 columns are always added to all, reflecting the business navigation tree (the number of columns reflects the depth of the tree). While adding a document or item, the knowledge provider classifies it according to the business subjects or processes to which it is relevant.

This model eases maintenance three-fold:

1. It is easy for the knowledge provider to add in the new content.

2. It is easy to classify any item, seeing the "big picture," i.e. classifying it to all relevant business processes/subjects, not only the one that triggered addition.

3. It is easy to build new areas defining new business processes or subjects. No new content stores have to be built, rather additional values simply have to be added to all existing stores, reflecting the new area, and the navigational tree has to be updated.

Even though the organization is defined mainly to ease accessibility of the users, maintenance turns easier and not more complicated.

Conclusions

A portal content organization model that aims to ease accessibility and therefore increase business use has been described above. The model, tested in at least a dozen portals in various organizations, business private organizations and public organizations; military organizations, industry organizations and high-tech oriented organizations. , In all cases, the model eased accessibility as the navigation was built to reflect business processes or subjects. Additionally to the navigation benefit, several other benefits exist:

The user finds it easy to access different pages, all with a similar look and feel, and therefore imparting a feeling of familiarity (all have almost the same portlets included).

The knowledge provider finds it easy to continue adding new content in one convenient place, yet classifying it while seeing the "big picture" of all business processes / subjects.

The Information Technology (IT) programmer has to make fewer changes as business needs grow and change.

The model was found beneficial in many ways, but chiefly in helping people concentrate on content and business rather than on navigation and access. It continues serving on new portals and rich content websites projects as well.

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