

Using Portal Technology for Managing Information in an Aerospace Manufacturing Environment

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Abstract

Portal technologies are becoming increasingly popular as a way to manage large amounts of complex information. This presentation is an overview of the development processes used on a portal project for managing information in an aerospace manufacturing environment.

The focus here is on the pre-production usability research, which included interviews with and observations of content owners, content users, management and others, to document processes, terminology, and artifacts; user navigation was also analyzed.

The final results were recommendations for a documents directory structure (taxonomy), content for the portal pages based on user profiles, prototype mock-ups, and recommendations based on user navigation.

Introduction

In 2001, an initial team was formed to inventory thousands of pieces of content on hundreds of Web pages. In February 2002, a usability engineer (UE) joined the team. The team was co-located in an e-Hoteling space with technical and support personnel.

A usability engineer was included to bring user-centered development methods to the project. Usability engineering is a process by which a product is developed by focusing on the needs of the typical user, who are busy people trying to accomplish tasks with specific products such as software (Dumas and Redish 1999).

This paper begins with a brief explanation of portal technology, then provides an overview of the usability process and general findings. Finally, the paper concludes with some thoughts about the process.

A Documents Directory

It is helpful to understand a few terms used by this specific portal technology. First is a “documents directory” (sometimes referred to as a “taxonomy”). This “crawls” content into the portal: it creates links to the documents and makes them searchable and browsable through the portal. This allows for the logical organization of links.

Links and content are then displayed as a “community,” with pages and sub-pages. A community can reflect an organizationally-based group, similar to many Web

sites today, or it can be role- or task-based, which users may find more helpful.

Communities display links in areas on the page called “gadgets.” Gadgets are components that allow integration of dynamic information into the portal, such as internal applications, company documents, or external web content.

The benefit of portal technology is that it makes it easier and more efficient to maintain content. In addition, links to the documents are automatically maintained, updated and reviewed to see if they are still valid.

Creating this type of structure can be challenging, however. For this project, the UE researched how content owners and users think about information – a user-centered approach – rather than how development teams often think about information in terms of an *impression* of users. This was achieved through an interview and observation process, a commonly-employed usability technique.

The Usability Process

Interviews with Content Owners

First, the UE interviewed and observed Content *Owners*, who collect and maintain content from many sources; they are rarely content authors. Most often, they gather content, reconfigure it, and post it to their Web sites.

Interviewees were selected based their job roles within the project organizations; interviews took place at their workstations. They were asked general questions about the tasks associated with their collection and dissemination of information. As a result, the UE identified that:

- Identical information is provided in different formats, such as PDF, XLS, and HTML.
- Similarly-named documents contain different information or different combinations of information.
- Some directories and Web sites are structured by airplane model, others by communication product. Still others reflect organizational structure.

Based on the interviews, the UE created a documents directory for Content Owners to organize information on servers, and for Portal Community Owners to structure the way documents and publications are presented.

Interviews with Content Users

The next step was to interview Content *Users*, who access the content as part of their jobs. Due to time constraints, Content Users were interviewed over the phone. The UE was supported in this effort by one of the developers. Levels of users were interviewed to examine different information needs. For example, a factory worker may access different types of information than an executive.

Interviewees were randomly selected from org charts of project organizations. They were asked non-leading questions, such as “What types of documents (or data, information, content, etc.) do you use on the web?” rather than “Do you use the such-and-such system?” Asking non-leading questions was to ensure non-biased responses.

After the interviews, the UE researched the Web sites mentioned. This resulted in a series of non-functional prototype mock-ups created for the developers, which included content and examples of layout and terminology.

Of special note here is the notion of user acceptance. As with any new technology, there is a transition period while users learn the portal technology. Efforts to ease this will take into account that users have a current set of tools they recognize and find helpful. By using recognizable names and images from these tools, a portal interface will likely make more sense. Web sites that make sense to the user are perceived as more credible (Fogg 2001).

Gadget developers should keep in mind the importance of recognizable names and images. It’s easy to replace an ampersand with “and,” or make other subtle changes such as using a synonym or not including an acronym in a heading. Developers should not “rename” tools. These details can make or break a portal.

User Navigation Analysis

In addition to interviews and observations, the UE examined current user navigation. The initial inventory of the Web sites (done prior to UE involvement) showed a massive amount of content located on many Web sites. While an inventory is a crucial first step when examining a complex information structure, it doesn’t report how a user *gets to* that information, while navigation analysis does.

The UE looked at the inventoried Web sites to verify the type of navigation needed by a user performing a typical task. For example, users have to access several Web sites to navigate to similar types of information. This is often the case for Web sites that are organizationally-based, rather than task-based or user-centered. Users should not have to know how your organization is structured in order to get to the information they need (Nielson 1999).

The UE analysis showed that current access to information can be greatly improved, perhaps the best argument for portal technology in this case. Well-designed “gadgets” can replace awkward navigation schemes.

Conclusion

As development times decrease in an effort to meet customer budgets and deadlines, there is the temptation to overlook the needs of users. Usability may be perceived as unnecessary to development in this type of climate.

As is shown here, usability isn’t just an evaluation that is performed at the end of the development cycle. Rather, usability is a series of techniques applied *during* development. The result is a product that can meet the needs of both the customer and the end-user.

In this case, a multi-disciplinary team worked together to support usability research, and still met a short deadline. This approach was made easier because team members from different disciplines and different groups were co-located at an e-Hoteling site, instead of at their regular workstations at different locations. This was likely a contributing factor to the success of this project.

It’s important to note the “systems usability approach” to this project. It isn’t as easy as just saying “Let’s replace that Web tool with a gadget.” Instead, it’s crucial that all Web tools, sites, and related information be examined as a system rather than as individual components. Related information is important because organizational memory (Ackerman 1994) often encompasses information from many sources. Future projects would benefit by taking this into account.

When applied thoroughly, a systems usability approach will reduce the likelihood that portals will become just like the Web is today — too much information that is difficult to access, and expensive to maintain.

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