When Visualization Matters
How New Tools from Antarctica, Groxis, and Macromedia Will Change Interactive Content Displays

By Geoffrey E. Bock
Sr. VP and Sr. Consultant, Patricia Seybold Group
Customer-Centric Solutions / Perspective

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A PREDICTION FOR 2004

Replacing Static Lists with Dynamic Views of Product Content

Visualizing content, we believe, is going to be one of the hottest developments in the enterprise content management marketplace in 2004. Soon, we are going to be able to organize and present all kinds of content components in intuitively understandable, three dimensional spaces. Application developers are going to be able to develop and deliver visually oriented, content-based business applications, based on their abilities to categorize content components in terms of extensive metadata definitions.

We are all too accustomed to managing the information glut displayed as static lists. We can search for prints by Picasso on Prints.Com, for example, and struggle to make sense of the 172 open edition prints that are in stock. We can sort the entire product catalog at Prints.Com by twenty themes, such as “architecture,” “contemporary,” “religious,” or “wildlife.” If we have the time, we can click on the thumbnail image of each Picasso print and view the larger image together with the pricing and shipping information. But if we want to find posters from Picasso’s Blue Period or see all of his nudes collected together, we have to have the patience to scroll and click through twelve screen displays and then drill down to view the larger images of promising thumbnails. We cannot visually explore Picasso’s art or see how different pictures are related to one another based on the themes that we think are important.

But changes in our ability to view, manage, and understand—in short, to visualize—large information collections are afoot. Sorted lists of titles, authors, artists, and other information attributes, arranged in a predetermined order, are going to become just one of a number of ways to organize content collections. In the not-too-distant future, we will also be able to group all kinds of content components intuitively, using predefined taxonomies of terms and other kinds of metadata. We will use an interactive, visual metaphor to manage and display the results. Rather than just viewing lists and drilling down to find related items, we will be able to picture relationships, based on self-describing views of the work we are trying to do.

An Accelerating Change

This transition will not happen overnight. We anticipate that industry visionaries and early adopters are going to deploy their initial visually oriented three dimensional application environments this year. We expect that the trend toward visualizing content displays will accelerate over the next 18 to 24 months, as application developers become more adept at managing the underlying content components and their associated sets of metadata. The end result will be substantially more intuitive (and powerful) content-centric business applications.

CONTENT VISUALIZATION TOOLS

Fueling our prediction for 2004 and beyond is a new generation of content visualization tools. These tools not only support graphical, visual displays, but they are also designed to incorporate and manage XML elements—the XML-tagged content components stored within XML documents. These tools can also be integrated with the schemas that define product content repositories.

No longer do application developers have to rely on custom coding predetermined visual displays and linking them to underlying data sources—a time-
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consuming and non-extensible method that they have had to use in the past to visualize information online. Rather, application developers can query the underlying content repositories, access the extensive sets of metadata, manage discrete content components, and dynamically display the resulting content in context.

Let’s look at the visualization capabilities that three vendors—startups Antarctica and Groxis and industry stalwart Macromedia—provide.

Visual Net from Antarctica

Vancouver-based Antarctica was founded in 1999 by Tim Bray, one of the authors of the XML specification. The company produces Visual Net, an interactive tool kit that works with qualitative, quantitative, and geographic data.

Visual Net manages content components within a visual landscape. It facilitates information browsing and drill downs by mapping content components into three dimensional Web page displays. It uses such visual cues as size, shape, color, and location to indicate the clickable icons and links. It presents results in dynamically generated HTML page displays—no browser-side plug-ins are required. It can combine multiple data sources into a single set of Web pages.

Thus Visual Net provides the graphical and interactive capabilities to visualize content in context. As shown in Illustration 1, clicking on one area of a screen display (a map of southern England) produces a more detailed view (all the hotels in Cornwall). In addition, the content categories (and underlying selection criteria) associated with a particular view can change, depending on the context. Visual Net incorporates the XML elements that describe the content components. It uses the metadata, captured by the predefined tag sets, to select and navigate to different content components. To continue the example from the Illustration 1, we can easily see where the posh hotels in Cornwall are located.

The end result is an intuitive set of visual page displays, rather than static information lists with fixed content categories. Through Visual Net’s reliance on an information-mapping metaphor, end users can visualize the content in a three dimensional, spatially oriented environment. They can click on different areas of the screen to refine their inquiries and find more specific content. Application developers have a new tool for managing product content, querying the metadata defined within the underlying content repositories, and displaying results.

Grokker from Groxis

Sausalito-based Groxis was co-founded in 2001 by Jean-Michel Decombe, one of the original developers of MetaTagger (an industry-leading metadata management tool that was acquired by Interwoven), and R.J. Pittman, a seasoned Bay-area entrepreneur. Outside directors and advisors include such industry luminaries as John Seely Brown, Paul Saffo, Stewart Brand, Jean-Louis Gassée, and Peter Senge. The company began shipping Grokker2 in December 2003 as a downloadable plug-in for searching content on the Web, products on Amazon, and files on PC hard drives. The company is planning to release the Grokker toolkit in February 2004, in which it will provide application developers with the APIs and SDK for producing customized, browser-based plug-ins that create three dimensional page displays.

Illustration 2 shows the Grokker toolkit in operation, as used by InterfaceFLOR, a provider of modular flooring systems. Using a browser-based plug-in, the Grokker-driven floor finder features side-by-side information panels with zoom-style interactivity. Clicking on an icon zooms into the underlying product content repository and dynamically assembles a related set of content components. No two screen displays are necessarily the same. Rather the information can change, depending on the selection criteria, the database-driven product information taxonomy, and the relationships among the product-related content components.

The Grokker toolkit provides an application development framework for extensive content visualization capabilities. The Grokker toolkit incorporates XML elements stored within any number of XML documents, which can be stored within multiple content repositories on the Internet. The Grokker toolkit can also provide application developers with the capabilities to connect to relational databases and legacy data sources.
The Grokker toolkit provides an application development environment for visually managing the metadata that describe content components. The Grokker toolkit can utilize either predefined information taxonomies (including those defined by the schemas of product content repositories), or it can create its own content categories on-the-fly. The Grokker toolkit includes automatic content clustering capabilities, by which it can categorize content based on the words and phrases contained within a content collection. The Grokker toolkit can filter and organize the content clusters based on business rules. Finally, it provides a graphic visualization engine for transforming the content clusters (identified by metadata definitions) into interactive screen displays.

Using the Grokker toolkit, application developers can begin to build a new generation of visually oriented, content-based business applications. They have a great deal of flexibility for querying the metadata schemas and taxonomies, mapping the underlying content categories, and presenting the resulting content components in three dimensional screen displays.

*Illustration 1. Visual Net from Antarctica maps context-sensitive content. Clicking on one area of the map produces a more detailed view. In addition, the categories associated with a particular view can change, depending on the context.*
But to successfully design these next-generation business applications, application developers will need to develop insights, use cases, and models about how the content is actually being used in digitally driven work environments.

**Flash MX Professional from Macromedia**

Well known for its ability to produce flashy, interactive experiences with its dynamic display capabilities, Macromedia announced its intention to enter the enterprise software market early in 2003 with the release of Flash MX Professional, the company’s content visualization product. The results of this concerted initiative are now beginning to bear fruit.

Flash MX Professional includes capabilities to connect to external data sources, such as relational databases and collections of XML documents. It can create and manage data-bound components—interactive, visual elements whose behaviors depend on data values within a relational database or the field/value pairs of XML elements. Flash MX Professional can update data-driven displays based on changes to the underlying data sources. It can invoke and manage its core scripting language, relying on data-driven values. The end result can be an interactive, content-driven visual environment that can provide fine-grained control of the underlying data sources.

For instance, as shown in Illustration 3, National Semiconductor is using Flash MX Professional to drive its Amplifiers Made Simple simulation environment, an interactive design tool that it added to
its Webench online design environment in December 2003.

Hardware design engineers can simulate online the performance of semiconductor devices required to design an amplifier over the Web. The tool offers instant access to the latest SPICE models, parametric data, and product information. It lets designers simultaneously compare the performance of multiple devices. It relies on in-context drill downs to display sets of product information, including the list of product components organized as a clickable bill of materials.\(^1\) Hardware engineers can view the performance of the amplifier or change its operating parameters by clicking on the appropriate icons.

Most important, Amplifiers Made Simple encapsulates a detailed understanding about how hardware design engineers categorize content and what kinds of product information they need. It provides the content in context—with links to the extensive set of product content information that National Semiconductor maintains on its Web site. Hardware design engineers are thus able to work in an interactive, visual environment where all of the

visual environment where all of the queries, parameters, and product information lists are readily at hand, categorized into familiar sets of information displays.

**GETTING READY FOR THE TRANSITION TO CONTENT VISUALIZATION**

The transition to content visualization is upon us. Content visualization tools, such as those provided by Antarctica, Groxis, and Macromedia, are indicative of an industry trend—our growing expectations to manage our information resources better by categorizing and visualizing intuitive relationships among sets of content components. With this new generation of tools now coming on the market, we are going to be able to organize and display visually in three dimensional space all kinds of content components, based on their underlying metadata definitions. We believe that this is an evolutionary trend, one that is become ever more feasible as each month passes.

What should you be doing this year to get ready? We believe that you need to be focusing on two things in 2004 as you further develop your enterprise content management initiatives.

First, the key to unlocking the potential of content visualization (and being able to overcome the morass of information overload) is being able to categorize your underlying enterprise content accurately. Depending on your business goals and objectives, as well as the nature of the content that you organize and deliver, you may need a comprehensive enterprise content taxonomy. You may need to ensure that this taxonomy not only categorizes all of your product information, but also captures key steps of your business processes. You may find that there are automated content categorization tools (including those in Grokker) that can address your requirements. It is going to be important to build upon an extensible set of content categories (identified from a technical perspective as metadata definitions) that address your strategic business requirements.

Second, it is time to begin prototyping and piloting content visualization solutions that can extend the capabilities of our content-centric enterprise application environment. We are all too accustomed to combining browsing with searching as we seek to organize content on our enterprise portals, e-commerce servers, and other Web-based enterprise applications. We are all too familiar with dashboard-style fixed lists of clickable items, in which we drill down from one set of links to another and hope to remember both our business contexts and what we are trying to do. With the new tools coming on the market, we no longer need to navigate only by titles and subject matter headings. We can organize the underlying content components so that we can begin to see what we are doing.

Designing these visual interactive solutions is going to be challenging. The effective solutions, we believe, are going to require explicit Customer Scenarios® describing how we expect to do our work. Designers and implementers are going to have to consider many more options than just the look and feel of screen display templates. Prototypes and pilots are the way to begin. The end result, we predict, will be a more satisfying and enjoyable interactive experience when doing work in the digital age.