Paper 206-26

Web Based DSS II:
Improving Web Information Organization and Presentation with SAS Version 8

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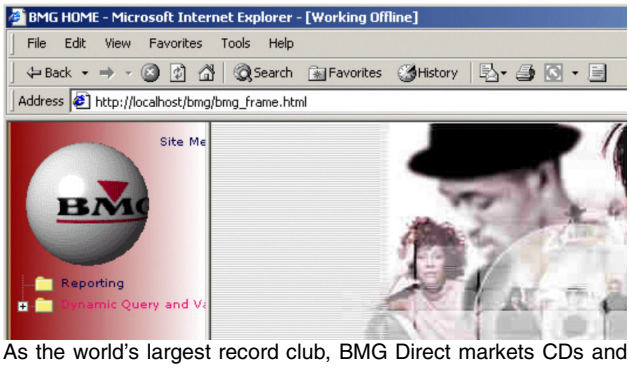
In a previous paper (*Web Based DSS*, SUGI-25) options and advantages associated with web based decision support systems were discussed. This article focused on the advantages of dynamic information access through a browser, as provided by SAS/IntrNet™ and SAS/WebEIS™. Examples provided were based on SAS® Version 6.12.

With increased use of the BMG Direct intranet site, expansion of the number and complexity of reports, and the introduction of SAS Version 8, new challenges and opportunities arose. For example, as the number of reports increased, the need for some form of report description became necessary, as well as a better organization of the available information. SAS Version 8 introduced much greater sophistication in web publishing capabilities. This paper examines these challenges and presents examples of the solutions which Destiny Corp. developed, as well as the opportunities for improved information availability and presentation which Version 8 presented for BMG Direct.

Information managers and end users should find the practical examples presented as indicative of the power and flexibility of web-based information distribution. For intranet web developers, code solutions to examples are included in the appendix.

INTRODUCTION



As the world's largest record club, BMG Direct markets CDs and music related products to over 11MM members in the US. As a direct marketer, BMG's success depends on the ability to communicate performance of a vast number of promotions along four primary channels: traditional direct mail, in the form of 16 to 64 page magazines mailed up to 20 times per year, through telemarketing to over 100,000 members per month, through its web site (www.bmgmusicservice.com), and through the newer medium of 'direct email'.

BMG Direct's Intranet web site for company performance information has proven to be an ideal medium for communication of many thousands of pages of statistics, graphs and written material to several hundred business managers in marketing, business planning and finance. During the past year several challenges have been met through an improved 'front end' which more clearly identifies information, including a description of most reports, and through the significant advancements in presentation offered by SAS Version 8. This paper introduces many of these features.

IMPROVING THE SITE TABLE OF CONTENTS

One of the primary complaints from users, particularly upper management, has been the 'front end', the top level html page which carried the hot links for most reports. That was part of the problem: the top level page contained a simple list of reports in a frame. As reports were added, the list became longer. There was no differentiation of content according to the audience, for example marketing users content was listed right along with Operations' reports.

In addition, titles for hot links were space constrained, limited to about twenty five characters. To the authors the titles were self-explanatory, to others many of the titles were cryptic. Many reports continued to be primarily summary tables in text and html, previously referred to as 'static' reports in two dimensions. Finally, the reports themselves included very little in the form of descriptive information, other than a report title and a few sub-title descriptions. No information was provided to explain fields such as "E-Addr" and No E-Addr".

All of these issues make reports difficult to find as well as to decipher for new and occasional users, as well as those who knew exactly what they wanted from the site, but had forgotten the path to get there. Going a level further, many users required further explanation of the individual fields in the reports themselves. Using a fundamental, simple html hot link sequence to access simple, static reports left little room for such user friendly information.

Another weakness in the front end was the inability to group information by logical categories along a second (or third) dimension, such as functional area – Finance, Marketing, Operations. Users readily identified with such groupings for sales, member counts, as well as operational metrics. Some reports could easily find a position in several categories, instead all reports were simply allocated a single slot in the list of reports. Only in a few cases could users discern the purpose and audience for a report according to its neighboring reports. For example, all web oriented reports were listed together.

The existing Table of Contents was nonetheless easy to maintain and easily modified for new reports and to new presentation forms, such as incorporating a different java applet. Could a more complex presentation - while more useful for end users - also be as easy to maintain?

While BMG had previously performed all development internally, it was decided the website needed a complete re-vamping to address these issues. One of the anticipated benefits was the introduction of new and revised reports utilizing some of the many features of Version 8 of the SAS system. Destiny Corp., a SAS Quality Partner based in Wethersfield, CT, was selected to perform the work for BMG. They had been working for nearly 12 months with the latest SAS revisions.

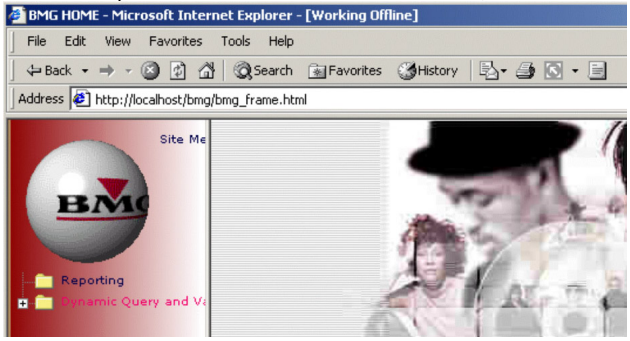
For the front end development, the team from Destiny Corp. considered a variety of forms emphasizing simplicity: One approach with appealing simplicity also had a desired familiarity: the directory form which Microsoft Explorer uses, a tree of expanding folders. A java applet was identified which provided the capability of an expanding tree, and an image of a folder was

added to complete the imagery. In combination, the symbology was immediately apparent: Folders were created with corresponding labels for “Marketing”, “Web Site”, “Finance” and “Operations”. Within each folder, additional folders could be added, to combine similar content, for example information on Web users.

So far, the presentation seemed ideal for most users. It also created a maintenance issue: the java text was cumbersome and it was difficult to discern the tree structure from within the code itself. In development, this only became obvious when folders did not expand to the desired content. Even minor modifications – adding a leaf to one branch – required many lines of code. Structural errors were correspondingly increasingly difficult to debug.

The repetition of the code pattern for the sequence of folders suggested a macro might be an appropriate technique. After a few false starts, an approach unfolded which also solved the maintenance problem. The macro technique would use as its source of data a flat text file. This file would contain the folder names, and a hierarchy index. References to URLs would be another field in the file. The maintenance issue was solved because it would be easy for non-programmers to maintain the text file. In addition, the structure of the folder hierarchy was easily discerned. The Base SAS program which produced the final HTML version of the Table of Contents required no ongoing maintenance for changes to the Table of Contents.

The new table of contents is immediately familiar: it looks a lot like the ‘Explorer’ feature of Microsoft Windows, based on an

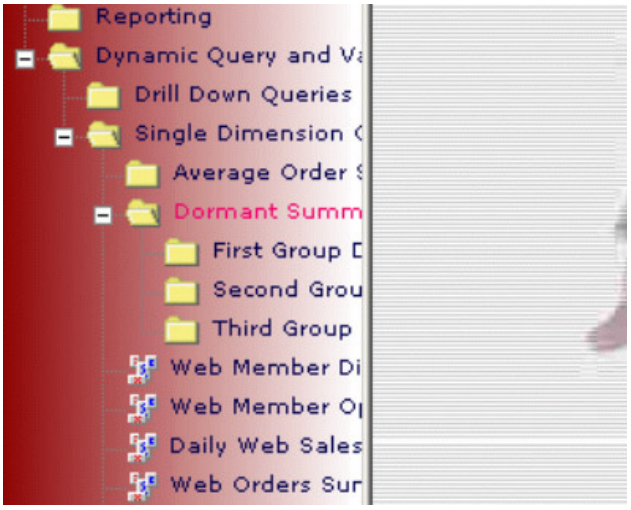


expanding tree structure several layers deep. This has enabled hyper links to the same report to be grouped under different headings such as “Marketing” as well as “Finance”.

By utilizing the ‘folder within a folder’ approach, a group of similar reports can be clustered under a sub-heading, such as “Sales

Reporting” or “Telemarketing Performance Reports”, below which a list of actual reports becomes available. Sales reports, which are applicable to both Finance and Marketing, can be available under sub-headings in both of these operational categories.

Folders Within Folders…



Within Folders

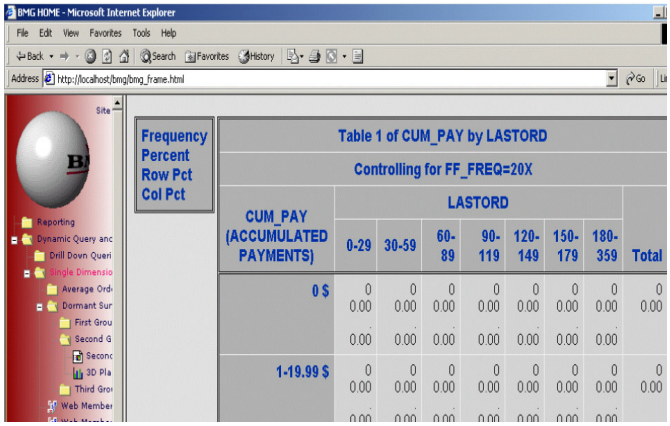
Finally, to provide more information to the user on the report itself, an additional field was added to the flat file, called appropriately “Report Description”. As a free form text field, a large amount of information can be stored here and surfaced to the user, as follows: as the user’s mouse ‘floats’ over a particular hot link, a ‘bubble’ description appears, providing a short description of the report, based on the content in the flat file. Implementation of this feature is in development. Of note, this approach applies equally to the folder descriptions, providing additional clarity of content for the user.

A technique for creating more information for the report fields themselves is being considered for future development. A similar approach is desired, one which would allow the user to float a mouse over a field, and generate a ‘bubble’ description of the underlying column or row.

EXPANDED WEB PUBLISHING CAPABILITIES

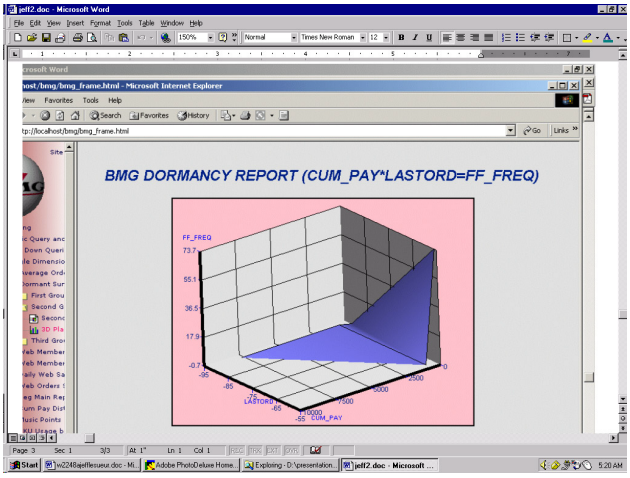
Most of BMG’s original reports were based on the two HTML macros, “TAB2HTM” and “OUT2HTM”. This resulted in reports consisting of increasingly long sets of HTML based tables, or repetitive, difficult to search frequency tables in straight text form.

Enhanced table presentation available through applets within SAS WebAF was particularly advantageous for one report, a large accounts receiveable liquidation table. With TAB2HTM, this table of 30 columns would be presented in five sections since the width was greater than 175 characters. With java based presentation capability, the table can be shown in one section on the screen, with greater control over formatting. Greater control and improved presentation equates to improved communication of the information itself.



SAS WebAF Based Table Presentation

Enhanced information presentation capabilities introduced with SAS Version 8 have also been used extensively to eliminate much of the previously awkward presentation forms. Through ODS a more consistent look and feel has been established. With the XML table form, improved graphic renditions of tables and graphs have been introduced, graphs which also provide for a simulated 'drill down' capability, without the invocation of the elaborate applets associated with the more robust, applet driven version of SAS/WebEIS.

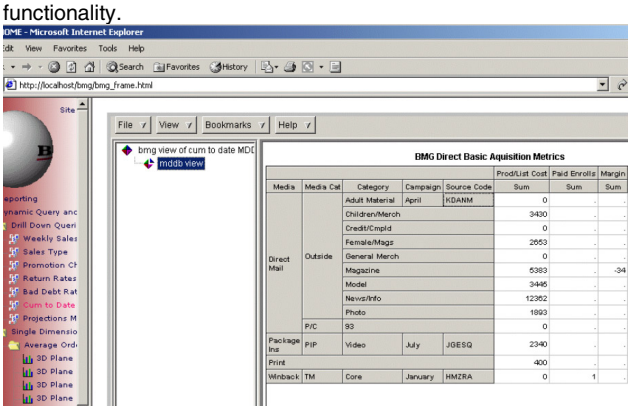


3 Dimensions in XML

In all, over twenty existing reports have been modified and a dozen new reports introduced, covering content for Marketing, Finance as well as Operations. End users have recognized the improvement in content with a caveat: they want more content, and are willing to sacrifice form in the interest of quicker development.

Average Order Size Box Plot

The use of an outside firm for the continued development of the website has been frustrating for some BMG developers, who see the utility of the new features of SAS Version 8 yet do not have the time to develop their skills and ascend to this new plateau of functionality.



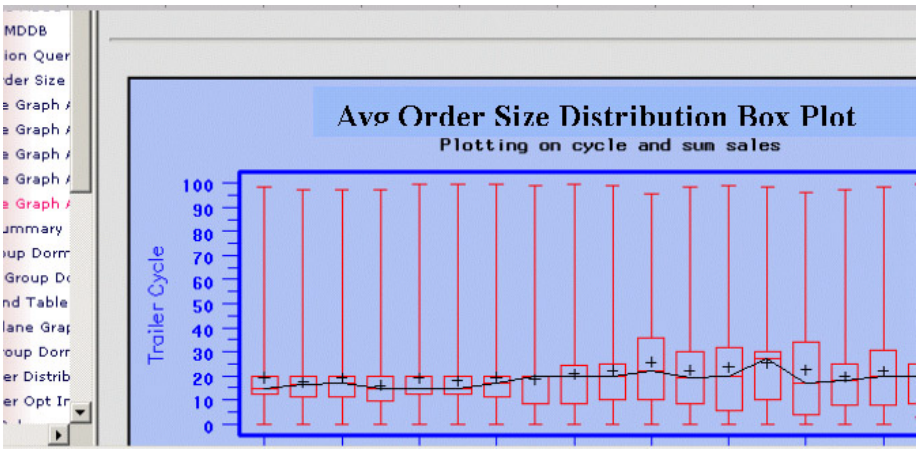
MDDB and WebEIS for MultiDimensional Views

The compromise on the other hand can be viewed as a good one for management: who better than internal developers are better qualified to specify new reporting requirements? In making this marriage work, management has recognized the strengths that both parties bring to the table. In stressing such programs as "Changes and Enhancements, Version 8.0" SAS educators such as Destiny Corp. are able to make users aware of the new functionality, while also providing the development resources for more effective exploitation of the new features. Ideally, templated examples developed by outside experts can be used by internal developers to continue development after the contract is concluded.

NEXT STEPS

Some of the weaknesses of existing reports include their 'one dimensionality': the reports are static. Expanded use of java applets creates a maintenance issue and does not improve speed of execution. By adopting increased use of JSP (Java Server Pages), more dynamic user control of content will become available, at the same time improving speed of delivery.

Perhaps the most significant step is improving ease of use by adopting the 'ultimate' thin client: hand held devices such as the Palm Pilot. By adapting existing material to the more narrow screen of these much simpler systems, much of the 'weight' of a full computer can be eliminated without any serious loss in availability of information. This makes possible the concept of "information anywhere", even "what you want, when you want it" provided through dynamic information delivery, requested via wireless connectivity. Initial work in this area has been promising.



CONCLUSION

While the attractiveness of the site and its comprehensive, "one stop" nature for information may seem an appealing approach to distributing information, it must be noted that management level users have responded much more favorably to email delivery of URL tags for reports, generally distributed when reports are updated over a weekend.

That being said however, it must also be noted that the BMG Direct Website has

been in continuous development for nearly five years, a clear indication of the merits and long term usefulness of intranet website delivery. Web distribution began with simple directory references to text documents, PDF formatted documents were added shortly thereafter. Two years ago dynamic information access was added, via SAS WebEIS and IntrNet, providing more flexible and deep information access than is possible in two dimensions. Most recently a new front end has been developed and SAS Version 8.0 functionality added. The new developments in Java Server Pages promise an even higher level of functionality in the near future, utilizing the greater horsepower of the server in delivering web based content. BMG Direct has been investing in the future for some time now.

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APPENDIX

Developing the front end to the BMG site