DO-IT-YOURSELF: A SPECIAL LIBRARY'S APPROACH TO CREATING DYNAMIC WEB PAGES USING COMMERCIAL OFF-THE-SHELF APPLICATIONS

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Abstract: Many librarians may feel that dynamic Web pages are out of their reach, financially and technically. Yet we are reminded in library and Web design literature that static home pages are a thing of the past. This paper describes how librarians at the Institute for Defense Analyses (IDA) library developed a database-driven, dynamic intranet site using commercial off-the-shelf applications. Administrative issues include surveying a library users group for interest and needs evaluation; outlining metadata elements; and, committing resources from managing time to populate the database and training in Microsoft FrontPage and Web-to-database design. Technical issues covered include Microsoft Access database fundamentals, lessons learned in the Web-to-database process (including setting up Database Source Names (DSNs), redesigning queries to accommodate the Web interface, and understanding Access 97 query language vs. Standard Query Language (SQL)). This paper also offers tips on editing Active Server Pages (ASP) scripting to create desired results. A how-to annotated resource list closes out the paper.

1. INTRODUCTION

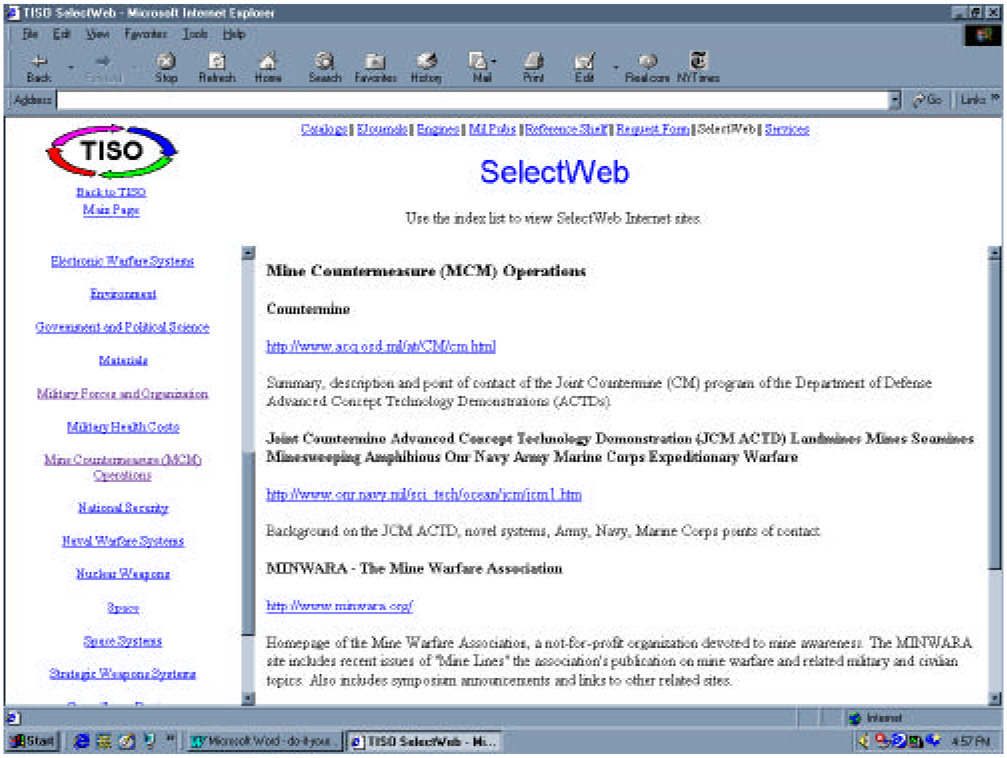
Do you remember how proud you were of your first Web page? Or when you first used frames as a way to aid the navigation of your Web pages? Do you look at your site now and still feel excited? Or are you like the rest of us who have tried to keep up with Web trends, only to see professionally designed Web sites rocket away beyond HTML? Thrust yourself back into Web development by using the desktop applications readily available to you. Programming skills are not required; but with a few books and a workshop under your belt, you will be on your way toward creating a dynamic Web site.

Your Web site redesign now depends on a database. Roy Tennant wrote in *Library Journal* recently that there is "A Database for Every Need" [1] and you will certainly need databases for your future Web work. You will also need to come to terms with the fact that you will no longer be able to do all your page authoring using a simple text editor. Take the time to explore the Web design applications available in the marketplace. Sure, you will need to relearn how to craft even simple pages. But do you really want to continue typing out every <P> and <H1>, just because you were the first person in your office to learn HTML five years ago? Do not let yesterday's accomplishments be today's obstacles. Take the time and find the resources to negotiate today's Web development standards. You did it five years ago; you can do it again today!

[*] This author was an employee of the Institute for Defense Analyses at the time this paper was submitted for publication.

2. BACKGROUND

The Institute for Defense Analyses (IDA) is a federally-funded research and development center. IDA provides studies and analyses for the Office of the Undersecretary of Defense (Acquisition and Technology) and other sponsors. The Institute's library, officially known as the Technical Information Services Office (TISO), employs a staff of eleven information professionals and technicians supporting researchers' subject needs in the areas of system evaluation, technology assessment, resource and support analyses, and force and strategy assessment.



Catalogs | Ejournals | Engines | Mil Pubs | Reference Shelf | Request Form | SelectWeb | Services

SelectWeb

Back to TISO Main Page

Use the index list to view SelectWeb Internet sites.

Electronic Warfare Systems

Environment

Government and Political Science

Materials

Military Forces and Organization

Military Health Costs

Mine Countermeasures (MCM) Operations

National Security

Naval Warfare Systems

Nuclear Weapons

Space

Space Systems

Strategic Weapons Systems

Mine Countermeasure (MCM) Operations

Countermine

http://www.acq.osd.mil/at/CM/cm.html

Summary, description and point of contact of the Joint Countermine (CM) program of the Department of Defense Advanced Concept Technology Demonstrations (ACTDs).

Joint Countermine Advanced Concept Technology Demonstration (JCM ACTD) Landmines Mines Seamines Minesweeping Amphibious Onr Navy Army Marine Corps Expeditionary Warfare

http://www.onr.navy.mil/sci_tech/ocean/jcm/jcm1.htm

Background on the JCM ACTD, novel systems, Army, Navy, Marine Corps points of contact.

MINWARA - The Mine Warfare Association

http://www.minwara.org/

Homepage of the Mine Warfare Association, a not-for-profit organization devoted to mine awareness. The MINWARA site includes recent issues of "Mine Lines" the association's publication on mine warfare and related military and civilian topics. Also includes symposium announcements and links to other related sites.

Figure 1: First generation, link-based SelectWeb

In 1995, the library debuted the first edition of its Web site and received many kudos. The site's second edition came out a year later and has remained more or less the same until the initiative described below. Each of these editions relied on static pages of hyperlinks arranged by various categories. In 1998, efforts were underway to push the library's Web site into the dynamic Web publishing era. The library's Web team targeted SelectWeb, an existing collection of defense-related, annotated hyperlinks compiled by the library reference staff, as the basis for the new database approach to the Web. Figure 1 illustrates an example of what the SelectWeb page looked like. Library staff already had experience an Microsoft Access 97 database that was used to manage information requests, so it was an easy decision to select that application to manage the records of Web resources. Although no one in the library was quite sure how it might be done, there was the promise of publishing to the Web directly from Access. Later, the library purchased Microsoft FrontPage 98 in order to facilitate Web database publishing and interface design.

3. ADMINISTRATIVE ISSUES

Before embarking on the technical aspects of creating the database structure, several weeks of administrative meetings took place. The investment in planning and decision making in the areas of selecting Web sites, identifying data elements to describe those sites, and the responsibilities of various staff for managing the workflow, made the technical design an easier process.

3.1 Library Users Group

Before getting too far ahead of ourselves, the library invited the Library Users Group, a group comprised of members from each IDA research division, to meet and discuss the Web-related information needs of the research staff. After showing them sample records that described various defense-related Web sites, they expressed their interest in having the Web records also point to in-house resources that might complement those sites. The consensus developed it would be beneficial to IDA researchers if the library would seek out Web sites to support base-level, core competency research. The new library Web product would aid researchers who need to get "up-to-speed" quickly in areas outside of their expertise.

3.2 Metadata Elements

Taking the Library Users Group's interests into account, the library created a set of data elements including, but not limited to, author, site name, Uniform Resource Locator (URL), helper applications, IDA core competency, descriptor terms (The library chose to use the Defense Technical Information Center's (DTIC) Thesaurus as the authority for applying descriptor terms to Web sites.). After completing this task, we compared our list to OCLC's Dublin Core, a metadata working standard, and found many similarities [2]. This gave us the assurance that we had developed a reasonably sound list of data elements to identify and describe relevant Web sites. With the data elements defined, our database expert quickly constructed an Access database.

3.3 Populating the Database

Data entry. These words do not elicit excitement. Even though the library manager made it known that he considered "surfing the 'net," as it was labeled then, professional librarian work, motivating the library staff to populate the database with records turned out to be a long and drawn out affair. The authors suggest two strategies that will help future database projects succeed. First, make sure you do not burden your staff with a mandate to describe Web sites in exacting detail. The end-user will only give a Web site description a cursory glance before clicking on the link. Make your records read like book jacket blurbs and not high school book reviews. Second, be sure the efforts put forth by your staff are published to your Web site in an efficient and timely manner. We soon found that without the gratification of seeing one's records on the library intranet, library staff had no incentive to continue creating more records. Be sure to have a functioning Web database in place before committing time and efforts of others to populate it.

3.4 Training

It took some time to convince the primary Web author to abandon his basic text editor for FrontPage. For those of us who entered the HTML authoring world four or more years ago, knowing how to type out every tag had become a badge of honor. Half-hearted attempts at using FrontPage and other Web authoring tools ended with the same conclusion: "I can do this faster in Notepad." Unfortunately, HTML tagging skills alone do not serve today's Web publishing demands efficiently. When the need to get the Access database published to the intranet came to head, the advantage of using FrontPage was revealed. As with most things, you learn the most when given a problem to solve. On the way to finding a solution to the Web-to-database publishing problem, the library took advantage of FrontPage training. A day session on Web-to-database interfaces provided the answers the library had spent several weeks of effort trying to find. Training is well worth the investment.

4. TECHNICAL ISSUES

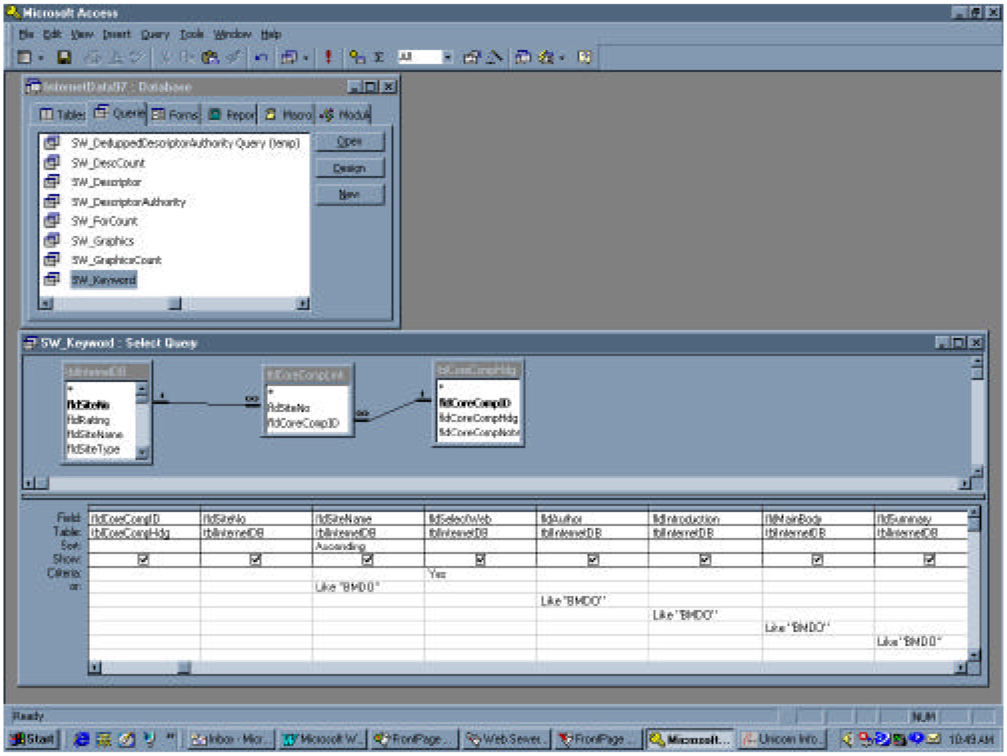
Once the library put all the administrative issues to rest, the challenge of executing the Web-to-database process lay before us. The FrontPage documentation provides a step-by-step example of database integration and serves as a fairly good roadmap for the uninitiated. What follows expands on that documentation. Consider it a travel guide of sorts that will further assist you in navigating your way toward dynamic Web pages.

4.1 Relational Database Fundamentals

Microsoft Access is a relational database. This means that instead of storing a flat file of data in rows and columns as you would in spreadsheet applications like Microsoft Excel, Access manages relationships between data tables. In this way, instead of writing the same information (e.g., category headings for different types of Web sites) over and over again, you can create a master table or list of categories to which another table (e.g., one that contains the data describing Web sites) refers. The three squares connected by lines in the middle of Figure 2 show the relationships among three data tables.

Queries, which allow you to extract a subset of records from a database, are constructed from data culled from tables and other queries. You will see how building queries is an important part of building an Access-driven, dynamic Web site. The rows and columns at the bottom of Figure 2 illustrate a query constructed to search for the string, BMDO (acronym for the Ballistic Missile Defense Organization), in multiple fields of a table.

Forms provide an interface for record input. They tie together all the tables into a single interface, so the user does not need to know how the tables relate each other or where data are stored. Figure 3 illustrates a form from the SelectWeb database.



InternetData97 : Database

- SW_DedupedDescriptorAuthority Query (temp)
- SW_DescCount
- SW_Descriptor
- SW_DescriptorAuthority
- SW_ForCount
- SW_Graphics
- SW_GraphicsCount
- SW_Keyword

SW_Keyword : Select Query

tblInternetDB: fldSiteNo, fldRating, fldSiteName, fldSiteType

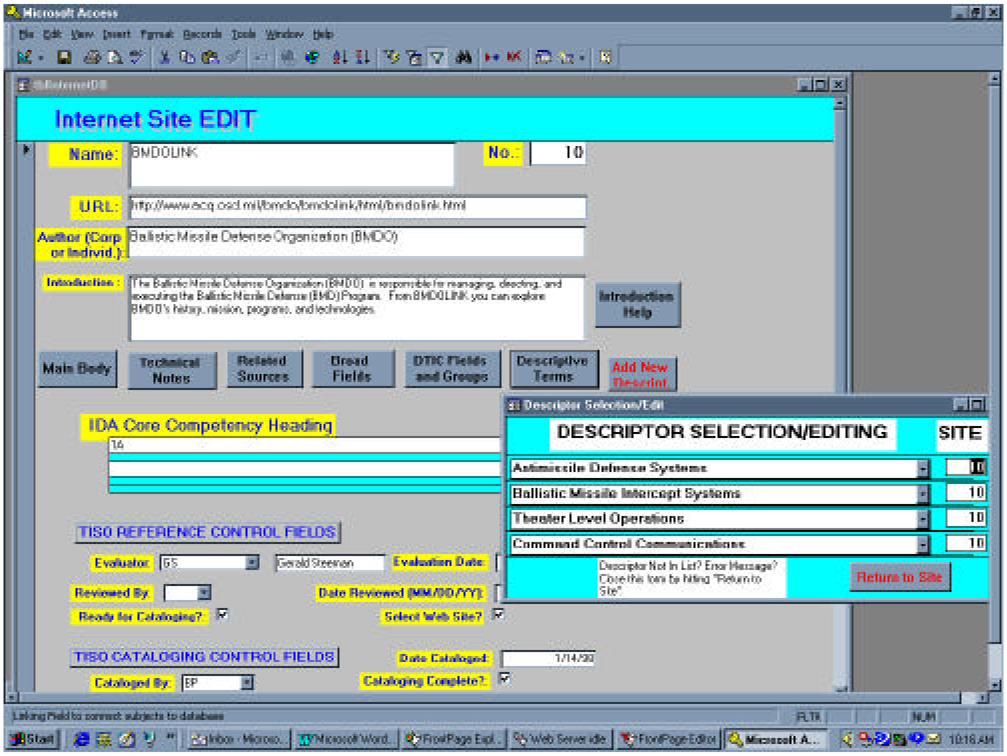
tblCoreCompLink: fldSiteNo, fldCoreCompID

tblCoreCompHdg: fldCoreCompID, fldCoreCompHdg, fldCoreCompNote

Field:	fldCoreCompID	fldSiteNo	fldSiteName	fldSelectWeb	fldAuthor	fldIntroduction	fldMainBody	fldSummary
Table:	tblCoreCompHdg	tblInternetDB	tblInternetDB	tblInternetDB	tblInternetDB	tblInternetDB	tblInternetDB	tblInternetDB
Sort:			Ascending					
Show:	☑	☑	☑	☑	☑	☑	☑	☑
Criteria:				Yes				
or:			Like "BMDO"					
					Like "BMDO"			
						Like "BMDO"		
							Like "BMDO"	
								Like "BMDO"

Ready

Figure 2: Building a keyword query in Access 97: Design view



Internet Site EDIT

Name: BMDOLINK

No.: 10

URL: http://www.acq.osd.mil/bmdo/bmdolink/html/bmdolink.html

Author (Corp or Individ.): Ballistic Missile Defense Organization (BMDO)

Introduction: The Ballistic Missile Defense Organization (BMDO) is responsible for managing, directing, and executing the Ballistic Missile Defense (BMD) Program. From BMDOLINK you can explore BMDO's history, mission, programs, and technologies.

IDA Core Competency Heading: 14

TISO REFERENCE CONTROL FIELDS

Evaluator: GS Gerald Steenan

Evaluation Date:

Reviewed By:

Date Reviewed (MM/DD/YY):

Ready for Cataloging? ☑

Select Web Site? ☑

TISO CATALOGING CONTROL FIELDS

Date Cataloged: 1/14/99

Cataloged By: EP

Cataloging Complete? ☑

DESCRIPTOR SELECTION/EDITING

DESCRIPTOR SELECTION/EDITING	SITE
Antimissile Defense Systems	10
Ballistic Missile Intercept Systems	10
Theater Level Operations	10
Command Control Communications	10

Descriptor Not In List? Error Message? Close this form by hitting "Return to Site"

Linking Field to connect subjects to database

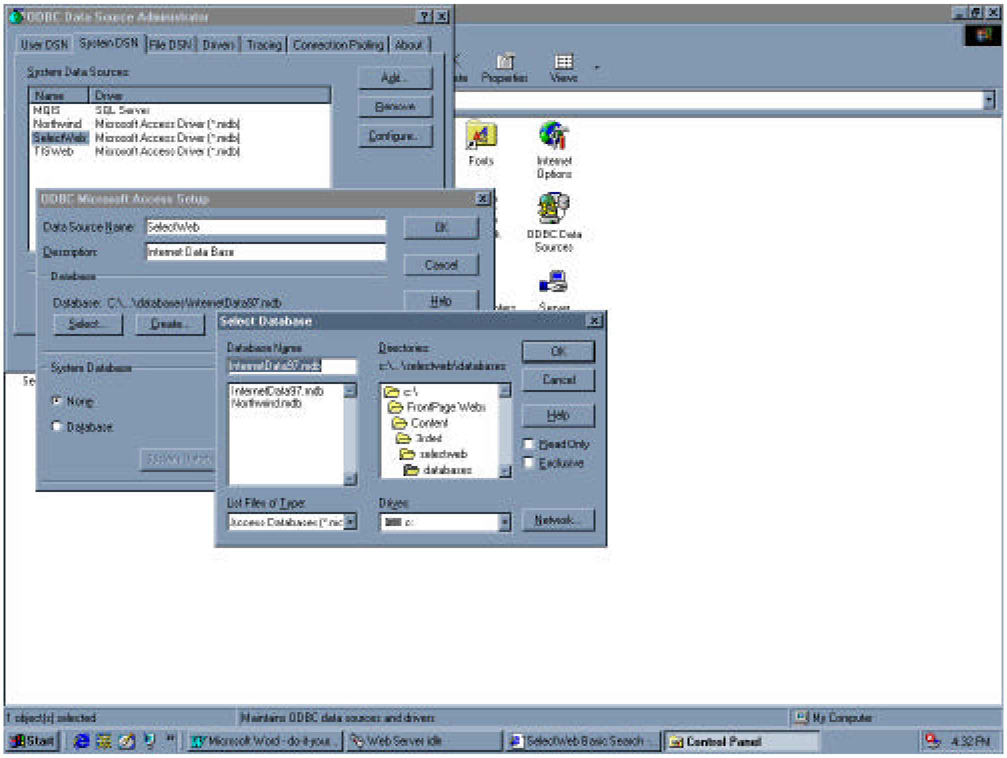
Figure 3: Access 97 database of Internet sites: Input form

4.2 Web-to-database process

In the Spring of 1999, there seemed to be little instruction available for the non-professional Web worker on how to integrate a database into a Web site. Understanding Database Source Names (DSNs) and how to set them up turned out to be a significant stumbling block.

Setting up Database Source Names (DSNs)

A Database Source Name (DSN) is the way for you to tell the computer hosting a Web site that you wish to point to a specific database. You can set a DSN on your PC, if your are hosting the database and Web site there, or on a Web server. In the latter case, you may need to ask your server administrator to set the DSN for you. Figure 4 shows the ODBC Data Sources windows specific to configuring a DSN.



System Data Sources:

Name	Driver
MQIS	SQL Server
Northwind	Microsoft Access Driver (*.mdb)
SelectWeb	Microsoft Access Driver (*.mdb)
TISWeb	Microsoft Access Driver (*.mdb)

Data Source Name: SelectWeb

Description: Internet Data Base

Database: C:\...\database\InternetData97.mdb

System Database: ● None ○ Database

Database Name: InternetData97.mdb

InternetData97.mdb
Northwind.mdb

Directories: c:\...\selectweb\databases

c:\
FrontPage Webs
Content
3rded
selectweb
databases

☐ Read Only
☐ Exclusive

List Files of Type: Access Databases (*.mdb)

Drives: c:

1 object(s) selected | Maintains ODBC data sources and drivers | My Computer

Microsoft Word - do-it-your... | Web Server idle | SelectWeb Basic Search... | Control Panel

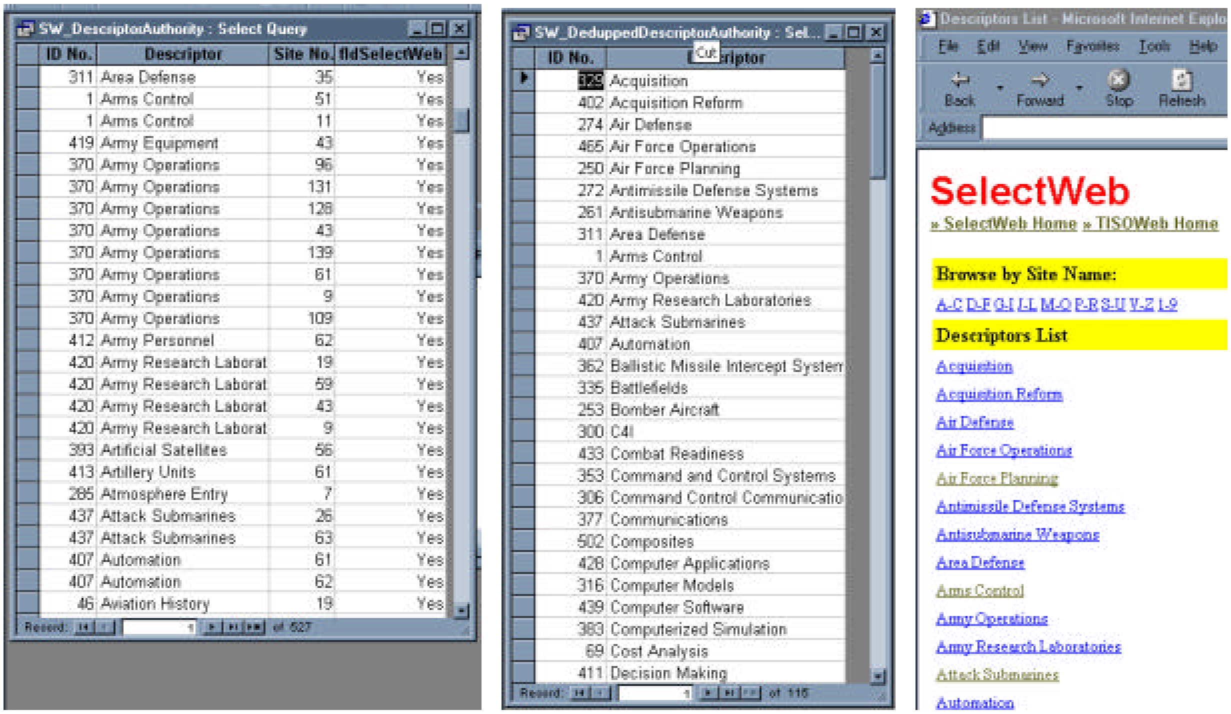
Figure 4: Configuring a Data Source Name (DSN) for your database

To set the DSN, choose ODBC Data Sources in the Control Panel window. Select the System DSN tab. Click on Add. Choose the Microsoft Access Driver. Decide on a Data Source Name. You may also enter a brief description of the database. Click on Select and use the file browser to find the database you wish to associate with your DSN. Click on OK to finish the process.

Now you can build a database region as described in the Microsoft FrontPage 98 documentation. A database region is a Microsoft tool for designing a search results area for a Web page. When building database regions, be sure you enter the exact DSN you selected earlier.

Redesigning queries

The critical step in building a database region in FrontPage is supplying the query language that instructs Access to give you the data you want. You can create a query in Access using Design View, and then copy and paste the resulting language shown in the SQL View. You may find it easier to create new queries in Access designed especially for your Web interface rather than using preexisting queries. By constructing query names like WebKeywordQuery, you can easily track down the Web-specific queries for future edits.



ID No.	Descriptor	Site No.	fldSelectWeb
311	Area Defense	35	Yes
1	Arms Control	51	Yes
1	Arms Control	11	Yes
419	Army Equipment	43	Yes
370	Army Operations	96	Yes
370	Army Operations	131	Yes
370	Army Operations	128	Yes
370	Army Operations	43	Yes
370	Army Operations	139	Yes
370	Army Operations	61	Yes
370	Army Operations	9	Yes
370	Army Operations	109	Yes
412	Army Personnel	62	Yes
420	Army Research Laborat	19	Yes
420	Army Research Laborat	59	Yes
420	Army Research Laborat	43	Yes
420	Army Research Laborat	9	Yes
393	Artificial Satellites	56	Yes
413	Artillery Units	61	Yes
285	Atmosphere Entry	7	Yes
437	Attack Submarines	26	Yes
437	Attack Submarines	63	Yes
407	Automation	61	Yes
407	Automation	62	Yes
46	Aviation History	19	Yes

ID No.	Descriptor
329	Acquisition
402	Acquisition Reform
274	Air Defense
465	Air Force Operations
250	Air Force Planning
272	Antimissile Defense Systems
261	Antisubmarine Weapons
311	Area Defense
1	Arms Control
370	Army Operations
420	Army Research Laboratories
437	Attack Submarines
407	Automation
362	Ballistic Missile Intercept Systen
336	Battlefields
253	Bomber Aircraft
300	C4I
433	Combat Readiness
353	Command and Control Systems
306	Command Control Communicatio
377	Communications
502	Composites
428	Computer Applications
316	Computer Models
439	Computer Software
383	Computerized Simulation
69	Cost Analysis
411	Decision Making

Descriptors List - Microsoft Internet Explo
File Edit View Favorites Tools Help
Back
Forward
Stop
Refresh
Address

SelectWeb

» SelectWeb Home » TISOWeb Home

Browse by Site Name:

A-C D-F G-I J-L M-O P-R S-U V-Z 1-9

Descriptors List

Acquisition
Acquisition Reform
Air Defense
Air Force Operations
Air Force Planning
Antimissile Defense Systems
Antisubmarine Weapons
Area Defense
Arms Control
Army Operations
Army Research Laboratories
Attack Submarines
Automation

Figure 5: Creating a descriptor list: Access to the Web

One of the features that the library wished for SelectWeb was a dynamically generated list or index of descriptor terms. Descriptor terms are subject headings found in the DTIC Thesaurus mentioned earlier. Two problems needed resolution in order to generate this type of dynamic list: 1) exclude all descriptors not associated with active records, and 2) remove multiple occurrences of descriptors. The first problem was easy to solve. We constructed a query that selects only the descriptors of records flagged as ready for SelectWeb. This, however, created a list of descriptors with multiple occurrences of many terms, because every record pointing to a particular descriptor resulted in that descriptor being returned to the resulting list. The next solution involved creating a preset query on the database side that handled the first problem, and then a second query that "dedupped" the results of the database-side query. The result was a Web page that dynamically generates a list of valid descriptors. Any time a new descriptor is added to a SelectWeb record in Access, the resulting Web list reflects the addition. Figure 5 illustrates the steps from left to right: query for SelectWeb descriptors, "dedup" those results, and design Web page to display results.

Understanding Access 97 query language vs. Standard Query Language (SQL)

What the FrontPage documentation does not tell you about database integration is that the Access generated query language may need slight editing before it will work from the Web page. A prime example involves wildcard symbols. The ***** in Access needs to be a **%** in FrontPage. Not being aware of this quirk resulted in hours of frustration. So beware, if your query does not seem to work even though you did everything by the book, read up on SQL to see if an adjustment is in order.

5. SPECIAL FEATURES AND EDITING HINTS

Once you are involved in creating Access-driven Web sites, it is hard not to get bit creative and want to go beyond the stock capabilities of FrontPage. What follows are a few database and Active Server Pages (ASP) hints for adding more functionality to your site.

5.1 Pre-coordinated Hypertext Queries

Once you have created a database region (the area where search results are displayed in FrontPage) you can then construct a form-based search using POST as the method of delivering the search terms to the database. Using HTML forms to submit search terms is fine for most situations; however, you may wish to craft a page of links that query the database and return records. Consider the descriptors list mentioned earlier. The list is nice to see, but your users will want to click one or more of the desired terms and see results. FrontPage 98 does not provide this feature, but you can force to.

The following paraphrased instruction is from *FrontPage 98 Bible*.

Find the file, C:\Program Files\Microsoft FrontPage\bin\DB_StartBotASP.txt and make a back up copy of the file. Open the original file and find the following lines:

```
End If
     fp_sValue = Request.Form(fp_sField)
```

Then add these lines directly after those listed above.

```
' try querystring if form doesn't work
      If (len(fp_sValue) = 0) Then
      fp_sValue = Request.QueryString(fp_sField)
End If
```

Save and close the file.

These additional lines allow you to submit requests to the database from a hypertext-based query string. So after editing the ASP template file, you can hard code hyperlinks to perform a specific query like:

```
http:\\www.mysite.org/bydescriptor.asp?fldDescriptorID=23.
```

In the SelectWeb site, this query would call on the page, **bydescriptor.asp**, and tell it that the query field name to match on is **fldDescriptorID**, and the number wanted is **23**. When building a dynamic page like the descriptors list, just use the ASP code for the query field name variable. You have to dig around in the HTML view of your database region to extract code like this:

```
<%If Not IsEmpty(fp_rs) And Not (fp_rs Is Nothing) Then
Response.Write CStr(fp_rs("fldDescriptorID"))%>
```

Then place it behind the desired page and query field name like:

```
bydescriptor.asp?fldDescriptorID=<%If Not IsEmpty(fp_rs)
And  Not (fp_rs Is Nothing) Then Response.Write
CStr(fp_rs("fldDescriptorID"))%>
```

In the examples above the database field name, fldDescriptorID, is specific to SelectWeb. Your database field names will be different.

5.2 No Records Returned

Once your database region is set up and you are successfully sending queries through it, you may eventually see the message, "No Records Returned," when a search does not yield any results. Perhaps you do not wish that message to display. After all, it is a bit cold and blunt. To change the message, use Notepad to edit the ASP of the database region. Find:

```
fp_sNoRecords = "No Records Returned"
```

Then simply write your custom message in between the quotation marks. The message can even contain HTML tags. For example, in one area of the SelectWeb site, we choose to give the user another search form to use instead of a "No Records Returned" message.

A cautionary note to remember: FrontPage 98 will overwrite certain edits to its template ASP and thereby reset the template upon your saving the file. To bypass this irritating situation, be sure that you have constructed the page exactly the way you want it in FrontPage before making the final Notepad edit. You may also wish to make a back up copy of these specially edited files in case you accidentally edit them using FrontPage in the future.

5.3 Passing Default Form Data

Here is a nice feature for search forms. You can create a result page that uses the search terms submitted as a heading at the top of the search results page or as a default for another search form. Just place the following ASP code into your HTML where you wish the search terms to display.

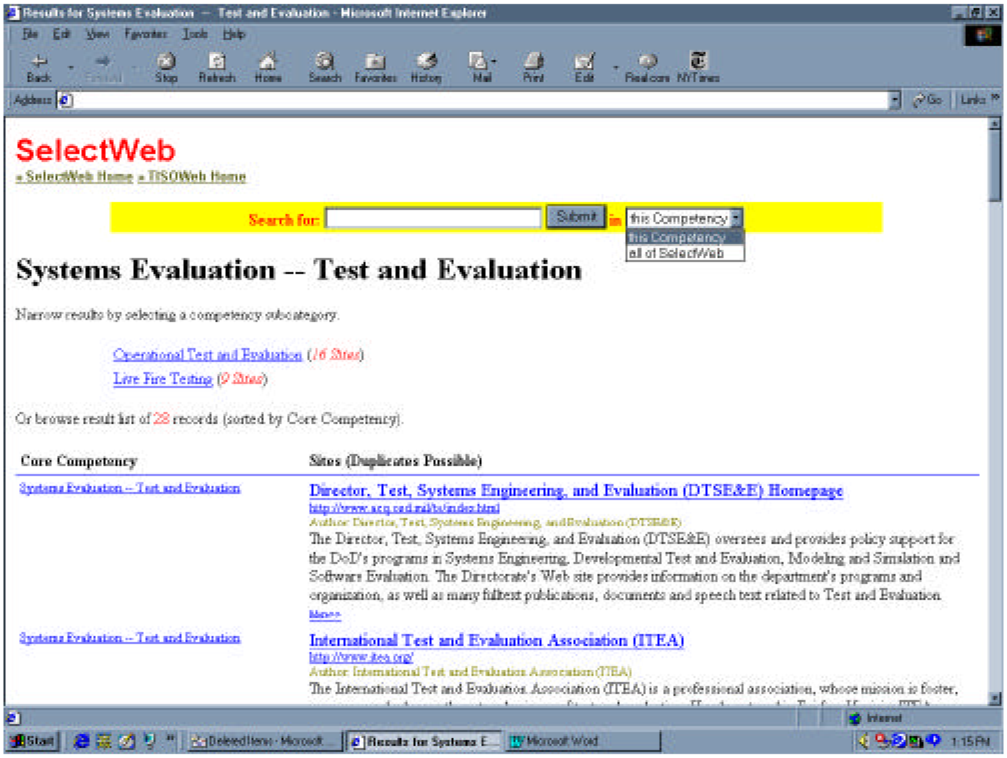
You can have a <H1> heading that reads:

```
<H1>Results for <%=Request.Form("keyword")%>.</H1>
```

Or you can have a form that defaults to the previous search terms, so your users can easily edit and resubmit searches. Set the initial value of the form to read:

```
value="<%=Request.Form("keyword")%>"
```

In both of the examples above, the variable, "keyword," is the form input name specific to SelectWeb. Your form input name can be any word.


Results for Systems Evaluation -- Test and Evaluation - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit RealGuide NYTimes
Address
Go Links
Start
Deleted Items - Microsoft
Results for Systems E...
Microsoft Word
Internet
1:15 PM

SelectWeb

» SelectWeb Home » TISOWeb Home

Search for: [ ] Submit in [this Competency ▾]
this Competency
all of SelectWeb

Systems Evaluation -- Test and Evaluation

Narrow results by selecting a competency subcategory.

Operational Test and Evaluation (*16 Sites*)
Live Fire Testing (*9 Sites*)

Or browse result list of 28 records (sorted by Core Competency).

Core Competency	Sites (Duplicates Possible)
Systems Evaluation -- Test and Evaluation	Director, Test, Systems Engineering, and Evaluation (DTSE&E) Homepage http://www.acq.osd.mil/te/index.html Author: Director, Test, Systems Engineering, and Evaluation (DTSE&E) The Director, Test, Systems Engineering, and Evaluation (DTSE&E) oversees and provides policy support for the DoD's programs in Systems Engineering, Developmental Test and Evaluation, Modeling and Simulation and Software Evaluation. The Directorate's Web site provides information on the department's programs and organization, as well as many fulltext publications, documents and speech text related to Test and Evaluation. More»
Systems Evaluation -- Test and Evaluation	International Test and Evaluation Association (ITEA) http://www.itea.org/ Author: International Test and Evaluation Association (ITEA) The International Test and Evaluation Association (ITEA) is a professional association, whose mission is foster,

Figure 6: Typical SelectWeb results page

6. CONCLUSION

The move from static HTML pages to dynamic ones using Access and ASP has radically changed the way the IDA library publishes content to the intranet. The benefits of "databasing" content for Web delivery are twofold. First, a database acts as an administative tool for managing the entry, review, editing, and publication of content to the Web. The records reside in a single location throughout the publication chain instead of word processor files and emails from contributors to the Web author. Second, a record can be called upon by the Web interface in multiple ways. If a record fits under two categories, its data need not be duplicated and placed in two areas of the Web site. The database record needs only to reflect a relationship to the two categories, so that it will become part of the results list of either category query. Figure 6 illustrates a typical Yahoo!-like page of the new SelectWeb. The user of the page has many pathways available--all of which are generated dynamically using the database and ASP. The search form posts keywords to the database, and it may be limited by the core competency category the user has already selected. Other links submit precoordinated requests for other subcategory results. And, of course, the user can click on a desired Web site's hyperlink to go to that resource.

Are we proud of our new Web site? Do we look at our site and feel excited? Do we feel like we have rocketed beyond our former static Web site? Yes, yes, and yes.

7. REFERENCES

[1] Tennet, Roy. "A Database for Every Need." *Library Journal*, December 1999, 41, 43.

[2] Dublin Core Metadata Initiative. "The Dublin Core Element Set Version 1.1" (2 July 1999). Viewed 20 January 2000: http://purl.oclc.org/dc/documents/rec-dces-19990702.htm.

[3] Elderbrock, David and Paul Bodensiek. *FrontPage 98 Bible*. (Foster City, CA: IDG Books, 1998) 433.

8. ANNOTATED RESOURCE LIST

8.1 Presentations

Morgan, Eric Lease. "DBMs and Web Delivery" at Access '99, (Guelph, Ontario), http://www.lib.ncsu.edu/staff/morgan/dbms-and-web-delivery/index.html.

Mr. Morgan's presentation "compares and contrasts three database applications and describes how their content can be made available on the Web." The applications discussed include FileMaker Pro, Microsoft Access, and MySQL.

Westra, Brian. "Bozeman and Great Falls Newspaper Index," a presentation given as part of "IntraNet Case Studies by Information Professionals" at the 1999 SLA Annual Conference (Minneapolis, MN). Available at: http://www.lib.montana.edu/~westra/sla/sla_newsindex.htm.

Mr. Westra describes the effort of producing a Web-based newspaper index using Microsoft Access and Cold Fusion. Topics include data conversion, database fundamentals, Cold Fusion Markup Language, and interface design.

8.2 Articles

Harker, Karen R., "Order Out of Chaos: Using a Web Database to Manage Access to Electronic Journals." *Library Computing*. Vol. 18, No. 1, 59-67, March 1999.

Ms. Harker's article details the University of Texas Southwestern Medical Center at Dallas Library's efforts at maintaining and publishing a listing of electronic journals on the Web. Tools used include Microsoft Access and ColdFusion. See: http://www2.swmed.edu/cfdocs/library/ejournals/ejnls.htm for the product.

Roberts, Gary. "Constructing a Database of Local Serials Holdings." *Computers in Libraries.* Vol. 19, No. 9, 24-33, October 1999. Also available at: http://www.infotoday.com/cilmag/oct99/roberts.htm.

Mr. Roberts explains the construction of Alfred University's Comprehensive List of Periodicals (http://lovelace.alfred.edu/serials/combi.html) using Microsoft Access and Active Server Pages (ASP) to deliver the list to the Web. This article contains several database solutions for incorporating and querying imported lists of holdings.

8.3 Books

Elderbrock, David and Paul Bodensiek. *FrontPage 98 Bible.* Foster City, CA: IDG Books, 1998.

This book builds upon Microsoft's own FrontPage 98 documentation by providing more illustrations and examples. It also describes work-arounds to achieve results FrontPage does not easily produce.

Walthier, Stephen, et. al. *Active Server Pages 2.0 Unleashed.* New York: Sams Publishing, 1999.

The book contains an entire chapter on using ASP with databases. Because FrontPage generates its own ASP, you will need a reference like this to piece together what is actually happening in the code if you wish to get creative.

8.4 Classroom Instruction

"Database Connectivity using FrontPage." NetMasters, Inc. (http://www.netmastersinc.com/) through the CAPCON Library Network (www.capcon.net).

The authors' personal experiences have taught us that it is best to have a problem to solve before going to such training. So you may wish to tinker with your Web-to-database project before heading off to class.