

## TREFOIL CORPORATION TECHNICAL CAPABILITIES

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### **Areas of Expertise**

Information and database management systems, relational database design, library systems, statistical and business data analysis systems, low-level programming and assembler, software engineering, theory of computation, personal computers and application software.

### **Development Languages and Platforms**

Extensive experience with Microsoft .NET development environment and languages, including extensive web development with ASP and ASP.NET including Visual Basic, Visual C++, C#, MS-Access VBA. Experience with HTML, XHTML, CSS, XML, XSLT. Additional recent experience with C, Intel Assembler, VBScript, Javascript, Cache Object Script, Cache Basic and other proprietary database languages. Prior development experience with Ada, Pascal, Smalltalk, various functional languages.

### **Database Platforms**

Extensive programming and database administration experience with Microsoft SQL Server and Transact-SQL, Microsoft Access. Additional recent experience with Intersystems Caché, RTI OpenInsight. Prior development experience with Advanced Revelation, Oracle, MySQL. Previous and minor experience with many other RDBMS.

### **Library Cataloging Systems**

Extensive experience with MARC and Dublin Core Cataloging systems, including parsing of raw MARC data, transformations between MARC and DC records, relational database management systems and XML. Experience with implementing Open Archives Initiative (OAI) data providers and Z39.50 query protocol.

### **Current Projects**

University of Maine Faculty-Staff Profile Database. This is a university-wide online annual faculty reporting system developed under the auspices of the Office for the Vice-President for Research, covering all aspects of faculty activity. This system was developed originally for a single college with 150 faculty in 2003. In 2006, the system was expanded significantly in terms of data collection and was redesigned to incorporate multiple colleges and rewritten in ASP.NET. In 2007 the other four colleges and 16 research units in the University were added to the system, and data collection was again expanded. Over 750 faculty and professional staff are now using the system. The project URL is <http://www.library.umaine.edu/fsprofile>. Review logins can be created on request.

The Digital Library: University of Maine System, and Fogler Library, University of Maine. Designing and developing components for cataloging, management and presentation of digital resources. Components include end-user dynamic webs, web and desktop-based staff tools for cataloging and metadata management, statewide patron validation and authentication for the Maine State Library Network (approximately 500,000 patrons), automated Z39.50 record harvesting and automated hacker trapping. Current work involves component and multiple database integration within a single Dublin Core based Digital Object Manager. Some public urls associated with this collection of projects are:

<http://libraries.maine.edu/mariner/>

(Main portal, UMS Libraries)

<http://libraries.maine.edu/gateway/>

(Digital Collections gateway)

<a href="http://libraries.maine.edu/mariner/ejournals.asp">http://libraries.maine.edu/mariner/ejournals.asp</a>	(E-journals)
<a href="http://libraries.maine.edu/mainedatabases/">http://libraries.maine.edu/mainedatabases/</a>	(Statewide Electronic Databases)
<a href="http://www.umaine.edu/cfru/publications.asp">http://www.umaine.edu/cfru/publications.asp</a>	(Cooperative Forestry Research Unit Publications)
<a href="http://www.library.umaine.edu/">http://www.library.umaine.edu/</a>	(Fogler Library subject portal)
<a href="http://www.library.umaine.edu/default_idb.asp">http://www.library.umaine.edu/default_idb.asp</a>	(Indexes and Databases)
<a href="http://www.library.umaine.edu/theses/index.htm">http://www.library.umaine.edu/theses/index.htm</a>	(Electronic Theses and Dissertations)
<a href="http://www.library.umaine.edu/lco/default.htm">http://www.library.umaine.edu/lco/default.htm</a>	(Listening Center Online)
<a href="http://www.library.umaine.edu/census/default.htm">http://www.library.umaine.edu/census/default.htm</a>	(Maine Census Data)
<a href="http://www.library.umaine.edu/scitechbus/">http://www.library.umaine.edu/scitechbus/</a>	(Science, technology and business portal)
<a href="http://www.library.umaine.edu/carr/">http://www.library.umaine.edu/carr/</a>	(Robert Venn Carr Collection)
<a href="http://www.library.umaine.edu/hudson/palmer/">http://www.library.umaine.edu/hudson/palmer/</a>	(Hudson Museum Palmer Collection)
<a href="http://library.umaine.edu/speccoll/portaldb/cohen.htm">http://library.umaine.edu/speccoll/portaldb/cohen.htm</a>	(William S. Cohen Papers)
<a href="http://www.library.umaine.edu/speccoll/PortalDB/search.htm">http://www.library.umaine.edu/speccoll/PortalDB/search.htm</a>	(EAD-encoded finding aids)
<a href="http://www.library.umaine.edu/ejournals/">http://www.library.umaine.edu/ejournals/</a>	(E-journals)
<a href="http://libraries.maine.edu/maineserials/">http://libraries.maine.edu/maineserials/</a>	(Maine Serials)

Development of personal and organizational planning software for Advanced Management Catalyst Inc. (AMCi). Software is designed to facilitate and manage development sessions using AMCi methodology designed by Dr. Michael Kelly. Five versions have been developed for different client types; several have been released in German. Software has been further refined for another client as part of a USDA Phase I SBIR grant.

Windows on Maine. A cooperative project of Maine Public Broadcasting, the Maine State Museum, and Fogler Library at the University of Maine. This project is an online service offering streaming video programs and clips, and other primary and secondary digital resources for educators and students in Maine. It features a searchable database of complete programs and video clips from MPBN, as well as audio clips, images, and other resources related to Maine history and the ecology of the Gulf of Maine. Project development included creation of tunable, parameterized full-text search in Intersystems Caché. See <http://windowsonmaine.library.umaine.edu/index.aspx>

Continuing design and development of forestry, land lease and paper mill management tools for various forestry companies. Current clients include International Paper, Sustainable Forest Technologies, and Lyme Timber Company. Applications include forest harvest planning, pesticide application planning, prescribed burn planning, lease management systems, paper mill/sawmill supplier quality control database, road construction planning, and logger efficiency tracking application.

### Recently Completed Projects

Principal Investigator for NIH SBIR Phase II Grant "Computer Aided Assessment of Early Vocabulary." Developing of program and underlying database for the redevelopment of the MacArthur Communicative Development Inventory (CDI) as an adaptive computerized test. The CDI was designed for toddlers and infants. The project involves implementation of adaptive computerized testing algorithms developed by Dr. Alan Cobo-Lewis and systemic redesign to broaden applicability to older children.

The Maine Music Box. Design and development of back-end database and web application programming for a digital archive of 20,000+ pieces of sheet music, including scanned images and sound files. Web site has a public search interface and an instructional interface for music teachers with features to allow lesson design and secure access to copyrighted material. Project is accessible to the public at <http://mainemusicbox.library.umaine.edu>

E-commerce web site for The Camp Spot, a camp outfitter located in Livingston, New Jersey; serving summer camps in the northeastern states. See <http://thecampspot.com/>

**Other Projects**

Developed O\*NET 98 Database and Viewer for the US Department of Labor (DOL). This project is an ongoing effort to replace the Dictionary of Occupational Titles with a new system called the Occupational Information Network (O\*NET), incorporating the results of the last twenty years of research in Industrial-Organization Psychology into a comprehensive database of occupational information. Database and software were released on a national basis through the Government Printing Office.

In-house development of O\*NET-based tools for use by the workforce development community. Tools include Occupational Viewer, a tool for workforce professionals, Resume Builder, and Job Description Writer. Developed ValueComp, an O\*NET-based compensation management system for human resources professionals, in cooperation with Dorey, Reagan and Associates, Lansing MI.

Medical billing database and software for psychiatric practices.

Tax assessment and billing systems for small Maine communities.

Campus work-order system for University of Maine Facilities Management.

Case management software for Job Corps contractors.

Course and conference registration and management software.

Data entry software for large statistical studies.

Floor scheduling software for real estate offices.

Remote oximetry monitoring software for hospitals.

Low-level drivers for foot-pedals attached to personal computers.

Complete business management software for Liberty Graphics, Liberty, Maine; including customers and orders, inventory, print jobs, custom prints, ink formulations, artist royalties, production scheduling.