

Introduction

From the American consumer to the American warfighter, the ability to retrieve meaningful, current, useful information from the vast universe of information sources via the World Wide Web, is growing increasingly difficult. Not only is there an almost limitless number of information sources, but the problem is compounded by how information is interpreted. What the reader understands from retrieving the information may not be what the originator intended in providing the data. Fortunately, at least for the warfighter, help is on the way.

The Space and Naval Warfare Systems Command, in partnership with the Department of the Navy eBusiness Operations Office, developed the Technology eXchange Clearinghouse. TXC is an end-to-end e-business solution that provides early identification and integration of cutting edge technologies for the Navy.

TXC not only benefits official acquisition "programs of record," but it can also be applied to the fleet's latest operating concepts such as Sea Power 21 and FORCENet. TXC is all about bringing technological innovation to the fleet rapidly — and as an ongoing process.

The roots of TXC lie in decades of research and transition efforts by Navy scientists and engineers. The Clearinghouse automates what was formerly an exhaustive manual process. Starting as a pilot program fall

2003, the program is currently managed by the SPAWAR Chief Information Officer, with development performed at SPAWAR Systems Center San Diego. TXC was integrated into DON data services spring 2004.

TXC is more than a Web-enabled repository of technology information. Rather than capturing information in a single hierarchical format, information is stored in several industry and government classification schemes. Technology producers can describe their research or products using one of several industry standard classification schemes, such as the Association for Computing Machinery (ACM).

DON operating constructs, such as FORCENet, are also mapped to the body of information. A FORCENet user could search for specific technological capability, such as low-bandwidth collaboration, and learn what the latest developments are and how those developments might be integrated into a FORCENet environment.

Additionally, TXC has the ability to filter information by mission requirements (context), to provide innovative and comprehensive technology-based solutions. For example, in the context of "speed to deploy a technology," the filter of "maturity" could be applied. Resulting searches would return only technologies sufficiently mature to be useful.

Thus, TXC provides a Web-enabled method to search thousands of pieces of informa-

tion to find relevant technology solutions. The specific search method used in TXC is powerful and easy to use thus enabling both producers and users of technology products and services to navigate the TXC.

TXC Architecture ...

TXC's architecture uses a SPAWAR enterprise-wide license based on Oracle's 10g implementation (see Figure 1). The Oracle Orion Web server is used because of the high level of integration, security and performance required of the system. The database is accessed via Web services offered by the Java Enterprise Edition (J2EE) midtier. TXC supports both portal/portlet and direct application Web services.

Two physical servers are employed: one to provide front-end Web services and one to provide the back-end database. The front-end server is PKI-enabled, offers Web services and provides a firewall for the non-routable back-end network. To address future growth, the back-end server can be clustered under Oracle 10g beyond its initial quad Xenon processors with more than 700 gigabytes of main system storage.

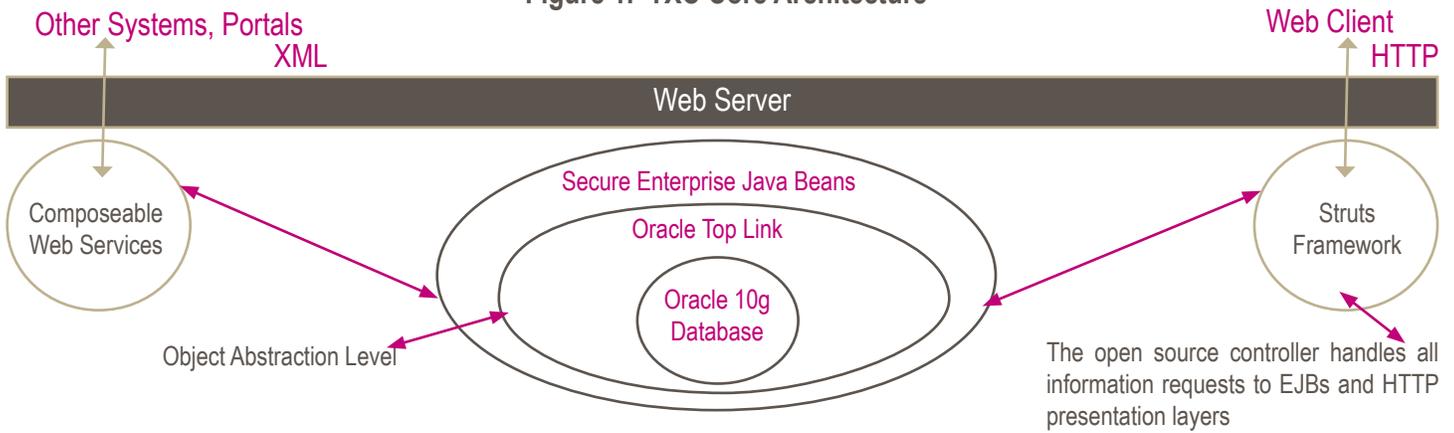
Both front-end and back-end clustering will be used for processors and system storage as the system grows. Data archiving of aged information to secondary optical storage devices will be used to maintain the responsiveness of the primary system storage.

The security model used within TXC employs a role and group access scheme. Security is maintained at field level access throughout offered Web services. Access to the system is limited, and access to individual product records is strictly enforced. Owners of product information are limited to information about their records only.

General information concerning the number of times a product record was accessed, times, dates, access group, etc., will be available as feedback to the product record owner.

The key to TXC's success is that it allows program managers, technologists, system designers and engineers to view retrieved information through their own frame of reference. Functions that can be performed include: Gap Analysis (actual

Figure 1. TXC Core Architecture



versus available capabilities); Duplication Analysis (multiple technologies with the same capabilities); Risk Analysis (maturity, funding, technical); and Capability Assessments (matching mission requirements).

TXC was designed from the ground up to provide Web services; its architecture is clearly a departure from traditional data warehouse strategies. Web services are only dependent on the level of access of the client. TXC simply publishes information for use by the client-base. Clients can reuse TXC information in either a portal or application context at their discretion.

An important feature of TXC is that it meets all Navy Marine Corps Intranet requirements for software on the client workstation, user authentication, client/server certifications and security restrictions. Any NMCI or PKI-enabled workstation can access TXC through any Internet browser.

Problems Solved ...

TXC provides a "one-stop shopping" solution to the chaos of multiple technology databases within both the commercial sector and the Department of Defense.

TXC provides vendors and owners of technologies an access point for the evaluation of their technologies and products, and it provides the Navy with a method for finding technology-based solutions.

These capabilities are combined with a collaborative forum to promote innovation and partnering. TXC translates many commercial and government groupings of information (ontologies) into navigable structures, with a primary focus on the capabilities that technologies bring to solve mission oriented problems.

TXC incorporates existing vendor information from the federal Central Contractor Registration (CCR) and FEDLOG to pre-qualify and pre-register clients. Potential clients access the system through the Internet at: <https://TXC.SPAWAR.navy.mil/>.

Additional access information is submitted and the client is approved for record input or access by the TXC staff. Once approved for access, a client can add product or service information through an easy-to-use pull-down menu structure. Existing product sources are also assimilated, such as the DON's Fleet Certified Product List through a bulk information sharing agreement.

Benefits ...

Beyond TXC's initial return on investment of more than 10 to 1 over previous manual methods, TXC offers the following benefits:

✓ Speed to deployment ... TXC provides a process to guide the integration of the right technology into Navy systems. It reduces the overall time to collect technology information, review it and match it to capability requirements.

✓ Better decisions through "instant trade studies" ... TXC provides the ability to perform trade studies literally at the push of a button. Users are able to select the criteria for the TXC report filter, including maturity, technology category, potential mission area, etc., and display the corresponding technology information.

✓ Cost savings through competition ... With the ability to perform instant trade studies, the user can shop vendor offerings for the best capability values. Additionally, in a fair and open market, the government can be

assured of the best value. All vendors will have the opportunity to bid.

✓ Comprehensive and timely information ... Technology developers and owners have a vested interest in maintaining their data records. The owners of the technology determine what public information they are willing to disclose, and the terms and points of contact for proprietary discussions.

TXC should not be viewed as a single solution, but rather as an enabler to the age-old process of bartering and trade. Both developers and users of technology-based solutions are able to engage in safe and meaningful interactions to determine if matches or partnerships are possible.

The Future Team ...

TXC has formed cooperative relationships with industry and government, and continues to offer partnerships with government and research communities. Sharing is part of the TXC business philosophy, to reduce overall development costs and grow the client community. New members to the partnership are always welcome.

To register a product or technology services from anywhere on the Internet, please go to <https://TXC.SPAWAR.navy.mil/>.

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