

Request for Information – Electronic Technical Work Document (eTWD) System

Agency: UNITED STATES NAVY

Directorate: Naval Sea System Command 04 (NAVSEA 04); Logistics, Maintenance and Industrial Operations

Department: NAVSEA 04X - Industrial Operations Management Office; eTWD Project Office, Portsmouth Naval Shipyard

1. Synopsis

This Request for Information (RFI) is issued solely for informational and planning purposes and does not constitute an Invitation for Bids, Request for Proposal, or Request for Quotations. This is a Request for Information only. The information learned from this RFI will be used in developing a more specific solicitation plan. The Final method of procurement when and if a requirement is finalized is unknown at this time. Funding information when and if a requirement is finalized related to this requirement is Government proprietary and will NOT be released. In accordance with FAR 15.201(e), responses to this notice are not offers and cannot be accepted by the Government to formal binding contract, nor do they affect a potential offeror's ability to respond to any future synopsis/solicitation which may or may not follow or restrict the U.S. Government's eventual acquisition approach. Additionally, the U.S. Government will not provide reimbursement for any information that may be submitted in response to this RFI. Respondents are solely responsible for all expenses associated with responding to this RFI. Interested vendors responding to this RFI may provide capability information for portions of this requirement, or for the entire solution (e.g. hardware, software and/or system integration). Respondents will not be notified of any results derived from a review of the information provided; however information gathered may be utilized for future technical and acquisition purposes. Time permitting and depending upon the information received individual vendors may be contacted for product demonstration. These product demonstrations (if offered) are optional for respondents. The U.S. Government will not pay for any costs associated with such demonstration(s).

2. Scope

NAVSEA's electronic Technical Work Document (eTWD) initiative Project Office is conducting a market survey for technology, commercial software, information technology (IT) hardware/equipment, and/or system integration services to implement a process improvement initiative named "eTWD Project". This initiative seeks to reduce the cost of ship maintenance in naval shipyards by replacing paper-based technical work instructions, references, technical drawings and work control forms with an online, electronic work package. The software/hardware/system(s) proposed must be capable of integrating seamlessly with the existing shipyards' suite of systems, and must be accessible in real-time by various trades/disciplines for accomplishing shop and shipboard repair work. The eTWD project will provide the capability for real-time

electronic access to work documents at work sites where ship maintenance is performed. It will immediately validate data collected, enable real-time collaborative problem resolution, job progress and work certification. The software proposed must operate in a large networked environment and process data/queries efficiently from both wired and wireless computers/devices.

3. Background

3.A The United States Navy (USN) has four Naval Shipyards (NSYs) that perform complex repair work on conventional and nuclear powered ships and submarines. They are:

3.A.1 Norfolk Naval Shipyard located in Portsmouth, Virginia.

3.A.2 Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility located in Pearl Harbor, Hawaii.

3.A.3 Portsmouth Naval Shipyard located in Kittery, Maine.

3.A.4 Puget Sound Naval Shipyard and Intermediate Maintenance Facility located in Bremerton, Washington.

3.B NSYs perform complex repair work in a multitude of industrial settings ranging from component repair in land-based production shops to welding, piping and electrical trades work in the confines of a submarine or aircraft carrier in dry dock. Technical work instructions govern all of the work done by shipyard personnel. These instructions are authored by engineers and executed by trade mechanics. The instructions:

3.B.1 Specify the sequence and work steps to be performed by various trades/disciplines;

3.B.2 Outline specifications and tolerances that must be adhered to and/or achieved;

3.B.3 Provide tables to collect required technical data, access to technical drawings, and special instruction/notes;

3.B.4 Establish the required ship system conditions and work controls;

3.B.5 Specify when certification attributes/signatures must be documented;

3.B.6 Are audited by inspection and compliance monitoring personnel to ensure both authoring and execution comply with strict USN standards and,

3.B.7 Become the certified, objective quality evidence (OQE) that tracks the history of work performed, by whom, validates work was performed to standards, and are used to certify completion of ship maintenance.

3.C NSYs currently have IT systems that support work planning, estimating, scheduling, material ordering and execution. For example, a corporate IT system named Advanced Industrial Management (AIM) provides the ability to plan ship repair work,

develop bill of materials and author work instructions. However, due to the complexity of shipboard work operations and the limitations of the system when it was developed, it requires the printing of a paper-based copy of the work instruction(s). These paper-based work instructions are incorporated within a “work package” binder along with paper-based copies of technical drawings and work control forms, then the binders are hand-routed to trade mechanics for job execution. If trade mechanics come across unexpected conditions (or deficiencies) when at the worksite, a paper-based deficiency form (DF) is issued. The DF and the work package are then re-routed back to engineering for resolution, and revisions to the work package are managed as necessary. Many work packages require a DF to be reported. It’s important to note the entire work planning and execution process is carefully controlled and must maintain the necessary work control/accountability to ensure the safe and reliable conduct of work.

3.D With this RFI NAVSEA 04 seeks to analyze manufacturing technology, commercial software, IT hardware/equipment, and/or system integration services to determine if systems with the requisite reliability, use-ability and affordability are available in the commercial marketplace. The eTWD Project Office is seeking information (to complement other ongoing research) about proven, commercial products and services in order to make an informed make/buy decision to most efficiently achieve the requirements for the eTWD Project.

4. Overarching Functional and System Requirements

4.A The technology, commercial software, IT hardware/equipment, and/or system integration services proposed must have the ability to SIGNIFICANTLY streamline and automate existing paper-based processes, while MINIMIZING the cost of implementation and process re-training. The ideal proposal will address requirements in the following Functional and System Requirements.

4.A.1 Functional Requirements (By Domain):

4.A.1.a System Integration: Any technology, commercial system and/or development project must integrate seamlessly with existing naval shipyard corporate applications. Interfaces with existing applications shall update/maintain data in job planning, scheduling, resource loading, financial and performance tracking systems. Paragraph 4.A.2.j (System Requirements-Integration) identifies configuration attributes of the current systems. The system proposed shall cache information to prevent data loss and provide auto synchronization with associated database(s).

4.A.1.b Technical Planning: The system must have the ability to accept a demand signal/notification from the existing systems that an eTWD is required, assign to supervisor for action, enable supervisor to access existing job planning information (from interfaces to current systems), assess due dates and daily priority, and establish detailed workflow assignments to manage the type of eTWD required, schedule authoring assignments, assign requisite technical review(s) and delegate final approval (s). Also, the system shall enable/require users to create associations, dependencies and sequences between/within required eTWDs.

4.A.1.c Authoring Work Instructions: ***Critical area - New technology is expected to yield substantial efficiency in this domain.*** The system must have the ability to efficiently re-use the existing repository of work instructions, utilize portions of the existing repository and/or write new detailed work instruction documents. These work instructions must be consistently formatted (e.g. titles, paragraph, numbering...etc). Authors of documents shall be able to incorporate visual control-based work instructions (e.g. pictures, video, training material...etc.). The system needs to streamline and automate existing authoring/review workflow processes, and automatically track/report progress of eTWD development. For example, it is expected that the software associated with authoring domains will include visual editing features allowing drag-and-drop features, object browsing trees, form factors (e.g. to consider size ratio of different displays/devices) and design-vs-execution views. The system shall adequately interface with existing systems to enable the author to research technical standards/information, and ship's system/material requirements. Included must be the ability for the engineer to research past problems, lessons learned, deficiency reports that have been documented from same/similar jobs done in the past at any of the 4 shipyards. The system shall provide standard document template libraries, and provide authors the ability to "mark-up" file drawings before including/linking within eTWD. It shall also enable the author to provide data collection fields/tables (within and/or between eTWDs), and ensure data collected complies with tolerances (after being entered during execution). Functionality is also required to enable the specifying of workforce training requirements and certification signatures associated with certain steps within a work instruction, and ensuring (in real time by interfacing with existing systems) that the worker performing the step or electronically signing the document has the requisite qualifications. Also, the system shall enable/require users to create, update, revise and/or delete associations, dependencies and sequences between existing eTWDs. The end result of the authoring phase is an interactive, electronic-based instruction document that clearly communicates work instructions, predecessors and successors instruction documents, prescribes work steps/instructions, sequences them in the order they must be performed (e.g. work flow diagram), links embedded to flag/launch supporting information (e.g. videos or past lessons learned docs) and have fields to collect/validate data and signatures.

4.A.1.d Work Package (eTWD) Integration: ***Critical area - New technology is expected to yield substantial efficiency in this domain.*** The interactive work instruction document (discussed in Para 4.A.1.c) is only one of up to ~20 different documents that altogether form the "Work Package" (i.e. eTWD). Other documents in the work package might include: cover sheet with special annotations, quality control records, material identity tags, trade-specific forms (e.g. mechanical joint, weld and paint/blast surface prep records), technical drawings and work authorization forms. Existing documents will have to be converted, re-formatted and stored in a format that allows them to integrate as part of the migration effort to eTWD. The system must provide the ability for a certain user type to integrate/make accessible the appropriate forms within the interactive work instruction, based on work type and job requirements. Additionally, eTWD shall have document management/versioning protocols that ensure only the most current approved document is used by the execution domain (Para 4A.1.f). The end result of this domain is a reviewed, final approved, interactive, electronic-based eTWD. This eTWD includes (or provides access to in real time) all the technical requirements associated with the work,

can be routed to project team personnel for job preparation and execution, and is in a format accessible (in real time) by users with wired/wireless devices on shop floors and shipboard.

4.A.1.e Work Control and Job Readiness (WC/JR): The system must have the ability to accept a demand signal/notification that an eTWD is required for execution, identify when it must be ready, it's ranked priority, and initiate/manage the processing of the eTWD through various WC/JR sub processes based on the requirements defined/applied in the previous domains (e.g. Authoring Work Instructions & Work Package (eTWD) Integration). For example, the eTWD may require routing to selected project teams/work cells to ensure the required ship system conditions are set, work controls are mapped/applied, material is ready and staged, testing has been planned and special tooling is reserved. Then it could be routed via the project manager to a specified supervisor for special review prior to it being concurred upon as ready for execution. Once approved for execution, the eTWD may be routed to multiple trades and support codes. WC/JR routings may require some work steps to be performed in series and allow others to be performed concurrently. Some routings may require electronic certification (e.g. e-signatures), while others may require less stringent electronic endorsements (e.g. e-initials). Some portion of the eTWD will have data collection that requires certification, and automatically prompts action if data is not within specification. There are multiple variations of WC/JR routings. Some are standard and some are custom. The system must have the ability to process create, modify, revise, store and delete standard and custom WC/JR process flows. Additionally, the system shall automatically provide a status board reporting the required routing, its current status in the route, and/or any issues affecting routing completion. At the end of the WC/JR phase, the eTWD (i.e. the work instruction, all associated documents and integrated training/data collection elements) has been routed through project team personnel, work controls have been assigned, work controls and system conditions set, job material/tooling readied, and the eTWD is in the trade Execution Supervisor's queue.

4.A.1.f eTWD Execution: For the production floor and shipboard worksites, the eTWD Project will present a substantially different approach for delivering, managing and executing technical work packages. Paper-based binders will be replaced with network connected (both wired and wireless) technology. The system must have the ability to queue work to one or more supervisors, work leaders and crews for execution. The work shall be queued only when the eTWD is authorized, work control is set and job readiness steps have been accomplished. A supervisor will have a work-in-process control queue (WIPCON Queue), and be provided the right Technical Planning information (from Para 4.A.1.b) enabling them to prepare for most efficient job execution. Also, users can easily access drawings, records and forms that have been incorporated within the eTWD (from Para 4.A.1.d), and be able to adjust viewing/resolution to accommodate device used. In execution, the system will track step-by-step accomplishment of work, and implement the training validations, electronic signature, data gathering and work certification requirements that have been incorporated per the aforementioned requirements in paragraphs 4.A.1.c-e. The system will report job status/progress within eTWD "dashboards", and interface with existing shipyard applications to update/maintain job planning, execution priorities, scheduling and

performance tracking systems. It shall also provide interactive “dashboards” to enable real time discussions about the jobs in daily production meetings, while at the same time collect notes/verbal transcripts about the job history, current status, work stoppages, lesson learned, helpful hints, deficiencies and opportunities to improve job execution.

4.A.1.g Andon & Deficiency Resolution: ***Critical Area - New technology is expected to yield substantial efficiency in this domain.*** Tens of thousands of work documents are developed/executed annually within the 4 naval shipyards. Many of them are for non repetitive work. Many deficiency forms (DFs) are issued to ensure the completeness of the specific technical instructions that govern (and ultimately document) the complex work performed. These reports often interrupt the work and require a technical review, and document modification before the job can resume. The eTWD system shall enable online, real-time, collaborative resolution of any unplanned situation (e.g. work control issue, uncertainty of intent of job step, opportunity to streamline job execution or an error in the work instruction). If an unplanned situation is discovered during shop floor/shipboard job execution, the workers will have the opportunity to identify the condition and what assistance is needed (supervisory consultation, project management team action, engineering evaluation, assist trade requirement...etc). The system will then derive the priority of the work, deliver notification(s) that assistance is required, and initiate online reporting & resolution records to efficiently resolve the situation and allow work to resume.

4.A.1.h Certification Records for Work Performed: Paragraph 4.A.1.a. (i.e System Integration) stressed the importance that any technology, commercial system and/or development proposed for the eTWD project must seamlessly integrate with existing naval shipyard corporate applications. Equally important is the integration of information management within each eTWD, and across interrelated eTWDs such that an auditable record of the eTWD package is maintained through development, execution, deficiency resolution and job completion. This formal record is programmatically accumulated as work is performed, such that when the final step of the eTWD is accomplished data collected will have already been certified and workmanship requirements already validated therefore the eTWD system certifies the work is accomplished to engineering specifications. Work accomplished is then reported to other shipyard systems and prompts adjustments to schedules, WIPCON Queues and other related work execution management sub processes (as necessary). Additionally, with an eTWD, the system validates work requirements with such high reliability that no further inspection or review is required to ensure accuracy/completion of work.

4.A.2 System Requirements:

4.A.2.a System Availability	The system shall be available 24 hours per day/7 days per week –with requirements for down time kept to a minimum (e.g. 2 hours monthly). Maintenance and enhancements to the system shall be applied without interruption to the user.
4.A.2.b Performance	The system shall provide real-time access to data via web-based interfaces. The system will return information for a specific record requested by the user within 5 seconds. Searches for data based on data values will be satisfied within three seconds, with appropriate indicators displayed to the user of search acceptance and progress.
4.A.2.c Scalability	The system shall be capable of handling up to 10,000 users per site, at 4 sites. Users range from engineers in offices authoring work instructions, to project teams at satellite sites applying work control/job readiness, and mechanics executing shipboard work.
4.A.2.d Security	The system shall conform to the requirements of the DOD Information Assurance Certification and Accreditation Process (DIACAP). The system shall comply with federal and OPM requirements for maintaining the privacy of personally identifiable information (PII). Commercial Off the Shelf systems shall meet applicable National Institute of Standards and Technology (NIST) controls for a “high” system.
4.A.2.e Usability	System users shall be able to learn and use the system for its intended purpose with self-paced online training in <8 hours. The system shall include robust “help” functionality.
4.A.2.f 508 Compliance	Respondents to this RFI shall consider the specific Section 508 accessibility requirements detailed in 36 CFR Part 1194.21. Information content deliverables shall meet applicable accessibility requirements.
4.A.2.g Access	System shall be accessed via a web browser (e.g. Internet Explorer) and/or be compatible with Citrix XenApp application virtualization.
4.A.2.h Cloud Computing	Per OMB’s recent IT Management reform Plan (available at http://www.cio.gov/pages.cfm/page/White-House-Forum-on-IT-Management-Reform), the federal government has a strategic preference for cloud-based solutions when procuring new IT systems.
4.A.2.i Open Source	The USN has an interest in deploying IT solutions that are entirely open source, or that contain open source components.
4.A.2.j Integration	System shall integrate with existing shipyard architecture including but not limited to: <ul style="list-style-type: none"> -HP Blades for windows-based servers w/ MSWin Server 2008 OS, -Oracle T and M series servers with Solaris 10 Operating systems, -Citrix based remote service provisions, -ESXi Virtualization platforms, -Wireless 802.11 standards, -Microsoft .NET Web Applications and -Oracle Database Environment.

5. Instructions for Responding to RFI

5.A Responding to this RFI does not obligate the U.S. Government to the incorporation of the solicited comments in any future procurement action nor does it obligate the Government to the procurement of any services or products. Proprietary information should not be included in the RFI response.

5.B Responses related to Enterprise Resource Planning (ERP) systems are NOT desired. The eTWD project initiative is focused on integrating efficiencies in limited work execution domains of NSY business operations. The USN currently has other ERP related initiatives in-progress.

5.C Questions about this RFI shall be submitted via email to: sheryl.a.martin@navy.mil no later than 30 calendar days from the posting date. You will receive acknowledgement of the question within 2 business days. Question and Answer data will be updated to this RFI as deemed necessary by the eTWD Project Office to provide clarifying information.

5.D Information provided in response to this RFI shall be submitted electronically to the USN/NAVSEA 04 eTWD Project Office (Portsmouth Naval Shipyard) within 40 days from the posting date of this RFI. Electronic responses can be provided in two ways:

Electronic Mail Addressed to: port_ptnh_etwd_project_team@navy.mil The project team will confirm receipt within 2 business days. Attachments are limited to 10Mb per email therefore multiple email messages may have to be sent.	Disc (3 copies) Mailed to: Commander Portsmouth Naval Shipyard Code 1250, MSSD Bldg 170/6 th Floor Portsmouth, NH 03804-5000
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5.E The Response to this RFI should include (at a minimum):

5.E.1 A letter containing:

5.E.1.a Statement that the information is in Response to eTWD RFI (Number);

5.E.1.b Vendor/Company Name, Address and Contact Information;

5.E.1.c Vendor's Contractor and Government Entity (CAGE) code;

5.E.1.d. Business Size and Size Standard/Classification (if applicable). Please identify your size classification relative to the appropriate North American Industry Classification System (NAICS) code.

5.E.1.e Identify if the company is a small business; HUBZone small business; service-disabled, veteran-owned small business; 8(a) small business; women-owned small business; or small disadvantaged business in order to assist the government in determining the appropriate acquisition method, including whether a set-aside is possible.

5.E.1.f. Identify if the company has existing contractual vehicles in place with the United States government (e.g GSA, ITES, NIH, SEWP..etc) and for whom the order is in place.

5.E.2 The following table and applicable annotation outlining Type of Capability proposed :

Type of Capability Proposed Matrix	X all that apply
COTS Software/Middleware – Manufacturing Execution System (MES) System	
COTS Software/Middleware – Manufacturing Process Management (MPM) System	
COTS Software/Middleware – Product Lifecycle Management (PLM) System	
Software/Middleware – Custom Software Development	
Software/Middleware – Other	
Productivity Technology – Interactive Electronic Work Instructions	
Productivity Technology – Multi-File Type Document Conversion/Integration	
Productivity Technology – Automated System/Work/Tagout Control	
Productivity Technology – Graphic/Visual Based Work Instructions	
Productivity Technology – Other	
COTS Hardware – Handhelds/Tablets	
COTS Hardware – Scanning/Document Management	
COTS Hardware – Wireless Network Infrastructure	
Hardware – Other	
Services – Business Analysis & Requirements Definition	
Services – Project Management & Systems Integration	
Services – COTS Integration & Implementation	
Services – Software Development	
Services – Custom Technology Design, Development and Integration	
Services – Other	

5.E.3 The following table and applicable annotation outlining which eTWD Project requirements (from paragraph 4 of the RFI) will be addressed by the proposed capability:

Product Capability to RFI Requirements Matrix	Achieves	Partially Achieves	Fully Achieves (with Customization)	Uncertain	Not Applicable
Functional Requirements					
Para 4.A.1.a					
Para 4.A.1.b					
Para 4.A.1.c					
Para 4.A.1.d					
Para 4.A.1.e					
Para 4.A.1.f					
Para 4.A.1.g					
Para 4.A.1.h					
Technical Requirements					
Para 4.A.2.a					
Para 4.A.2.b					
Para 4.A.2.c					
Para 4.A.2.d					
Para 4.A.2.e					
Para 4.A.2.f					
Para 4.A.2.g					
Para 4.A.2.h					
Para 4.A.2.i					
Para 4.A.2.j					

5.E.4. A succinct description of capability proposed. No more than 8 pages (not including brochures or product literature) outlining:

5.E.4.a Vendor/Contractor capability(s) as it would benefit eTWD Project. The response should correlate proposed vendor/contractor capability to the specific requirement(s) in paragraph 4 of the RFI.

5.E.4.b How the proposed capability is different from, and why it is better than other similar/competing products.

5.E.4.c An outline of proposed approach to implementation/integration of Vendor/Contractor capability for eTWD Project. For software development, this should include an explanation of source code control practices. For hardware, this should include an explanation of any required hardware integration services.

5.E.4.d Indication for cost of capability, integration and implementation. It is understood that cost estimates are difficult to provide. However, it is essential a method/thumb rule for estimating cost of product(s) is provided.

5.E.4.e Outline any recent implementations of proposed capability. Proven successful implementations, especially those in Department of Defense depot environments, should be highlighted and points-of-contact(s) identified.

5.E.4.f Describe components of the proposed capability that are open source.

5.E.4.g Describe components of the proposed capability that are cloud-based, or if cloud options exist (as applicable).