

University of Massachusetts Senior Design  
Project Request Form

**University of Massachusetts**  
**Department of Computer Science**

**Request for Project (RFP) Form**

Project Title Interactive Lifecycle Document Development with  
Requirements Tracking

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Company: Naval Undersea Warfare Center Division Newport

Date: 23 August 2013

(To be completed by UMass)

Team Number: \_\_\_\_\_

Student 1: \_\_\_\_\_  
(Project Manager)

Student 2: \_\_\_\_\_  
(Chief Systems Engineer)

Student 3: \_\_\_\_\_  
(Project Controller)

Student 4: \_\_\_\_\_

Student 5: \_\_\_\_\_

Advisor: \_\_\_\_\_

**Title:**

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## *Interactive Lifecycle Document Development with Requirements Tracking*

### **Description:**

*This RFP proposes to develop and demonstrate a PC-based system to develop and manage lifecycle documents including explicit tracking of requirements through design, development and test.*

*Currently, most lifecycle documents are developed and maintained in Microsoft Word and, at best, a spreadsheet is used to track individual requirements through design, development and test. There are systems available that can be used to develop and track requirements, but they are often very complex, expensive and require an underlying database. While this may be suitable, and even necessary, for very large projects, small to average projects just can't afford the overhead.*

*The Interactive Lifecycle Document Development with Requirements Tracking system will offer users a systematic method to develop these documents using open standards and non-proprietary processes and formats. The system will also allow users to track individual requirements through design, development and test, including an on-demand auto-generated Requirements Traceability Matrix. The final documents will have hyperlinks to allow seamless navigation between related aspects of each document.*

*This project will exercise the students' knowledge of the software engineering discipline in an explicit manner. In addition, it will provide experience with data modeling and XML-related development – two skills that are in wide demand.*

### **Scope:**

*The approach must operate on a PC running Windows 7. The chosen approach should support the following use-case:*

*A user starts the application and either selects an existing project or creates a new project. If an existing project is selected, the user is presented the main screen with a list of existing documents and their statuses. The user then chooses to either open an existing document or create a new one. If the user chooses to create a new project, he is prompted for a project name then presented the main screen where he enters general project information and selects a document for development. When a new document is created, boilerplate text will be offered where possible and the user will be prompted to enter project specific requirements, design elements or test cases, as applicable. When completed, the user exports the information to an HTML-based interactive document or document suite.*

### *System Inputs:*

- User entry
- Conformant XML instances

### *High-level System Requirements (not complete):*

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- *System shall present a GUI to users that allow them to develop and edit lifecycle documents (i.e. Requirements, Design, and Test).*
- *Ability to view existing requirements, design elements and test cases shall be available at all times.*
- *System shall provide a mechanism to associate related parts of each document. (e.g. Requirement x is associated with design element y and test case z.)*
- *System shall be able to auto-generate a Requirements Traceability Matrix at any point during development.*
- *System shall produce XML instances conformant with an XML schema designed and developed by the team.*
- *The XML instances shall be transformed, via XSLT designed and developed by the team, into an HTML-based interactive document.*

*Technical direction will be provided, as needed, to assist in the development a complete set of Use Cases and Requirements.*

### **Budget:**

*NUWC shall provide the necessary equipment and materials.*

### **Known constraints (if any):**

- Hardware (subject to change)  
*PC/laptop running Windows 7*
- Software (subject to change)  
*TBD*

### **Deliverables:**

*The project will require software development. The deliverables shall include the following:*

- *Project report hardcopy and electronic copy on CD ROM , consisting of:*
  1. *Design documentation including use-cases, requirements, class diagrams, system level diagrams, test plan, and test results as appropriate.*
  2. *User documentation which may include setup, usage, API, etc*
  3. *Source code for all developed components*
- *Developed system prototype, consisting of:*
  1. *Lifecycle document development system*
  2. *XML lifecycle documents*
  3. *HTML-based interactive document(s)*

### **Legal:**

*Unless otherwise specified all information is the property of the Naval Undersea Warfare Center Newport, RI and the University of Massachusetts, Dartmouth, Massachusetts.*