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How Melbourne is contributing to the contracts standards effort

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Abstract:

This presentation explores the documentation cycle for major Defence contracts, from initial RFQ/RFTs, through bidding, contract negotiation and award, engineering design and support engineering, through to the production and delivery of all product related documentation to the client. All of the documentation leads to or derives from the contract, so how the contractual documentation is designed (as documents) can have a major impact on the authoring and production of the document.

A case is made here that contracts should be structured according to SGML/XML standards that semantically tag document content. This offers several advantages (1) automated formatting – greatly reducing the cost of document production, (2) clear definition and easy tracking of contractual requirements, tender responses against requirements, and product delivery against requirements (3) easy establishment of related structural standards for downstream documents.

The presentation then reviews that status of the development of a Legal XML standard, and a variety of tools that have been developed or implemented in Melbourne (Australia) that would greatly facilitate implementation and application of the standard for major Australian Defence projects.

Finally, the RACE (Requirements and Contract Engineering) Online proposal for a demonstration project to develop and test such a standard is described.

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Overview

- Some background
- Why do we need “paperless contracting”?
  - Tenix and the defence/project mgmt industry
  - Personal
- International efforts
- Why Melbourne leads the world
  - Background and motivation
  - Capabilities
- The RACE Online project
  - Scope
  - Aims

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Issues:

Why is Legal XML for Contracts important for Tenix?

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Some background on Tenix

- **Tenix Group - $A 1.2+ BN turnover, 5,000+ staff**
  - **Largest Australian Defence Contractor**
  - **Divisions (~ 10)**
    - **Naval and commercial ships (e.g., Tenix ANZAC Ship Project)**
    - **Land, air and electronic systems**
    - **Infrastructure & support**
  - **Products**
    - **Ships**
    - **Land vehicles**
    - **Electronics**
  - **Activities & Services**
    - **Project management**
    - **Systems design & integration**
    - **Documentation and training**
    - **Logistic & base support**

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ANZAC Ship Project

- **10 frigates (8 RAN, 2 RNZN)**
  - **Total package**
  - **15 year design/build cycle**
  - **27 year+ design life**
- **$A 6 BN fixed price contract!**

#5 commissioned 31 March 2001

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Why are contracts important to me?

- **2 yrs commercial Documentation Coordinator**
  - Tried to manage subcontract flow down from precedents
  - Costs/delays from corrupt work, lost work, rework
  - Wasted opportunities to leverage knowledge: no one understood concepts
- **Logistics documentation systems specialist**
  - Contract analysis (understand delivery commitments)
  - Amendment (turn motherhood clauses into something we could deliver against, incorporate new technology)
  - Writing software and service contracts
  - Implementing state of the art authoring and content management incorporating lessons learned
- **When I moved to ILS my wife inherited the commercial documentation coordination role**

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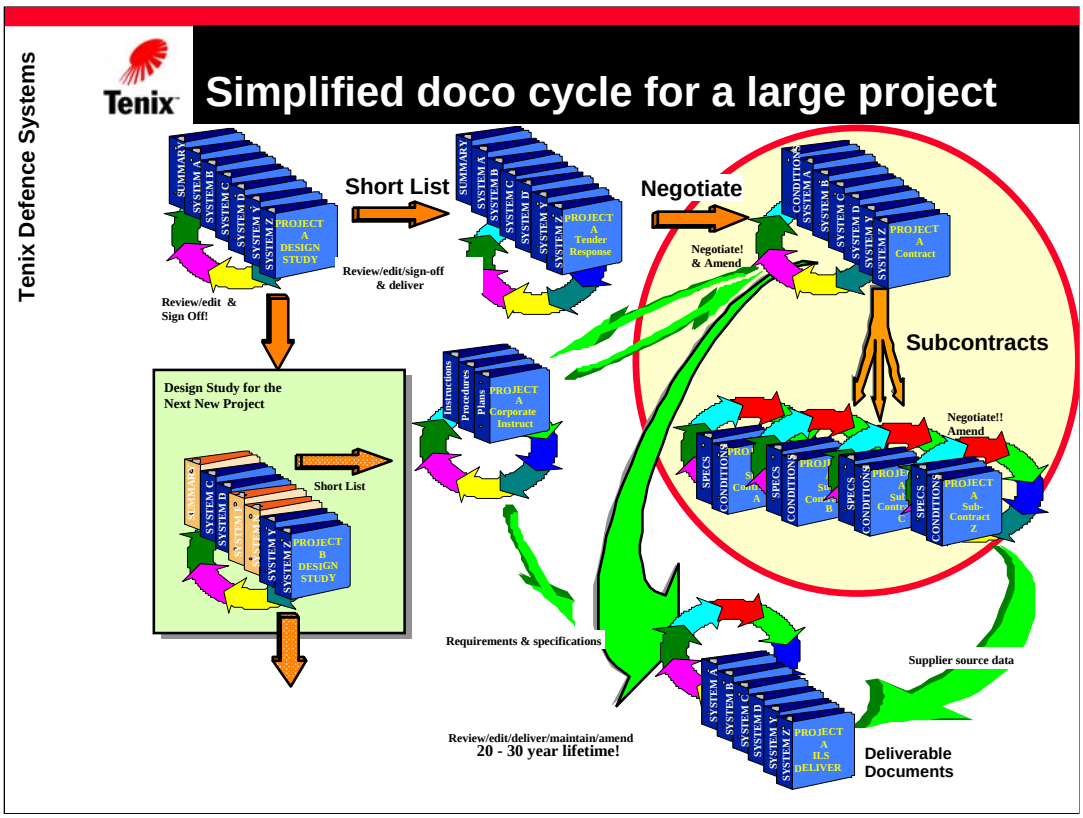
Managing contract related knowledge over the project lifecycle



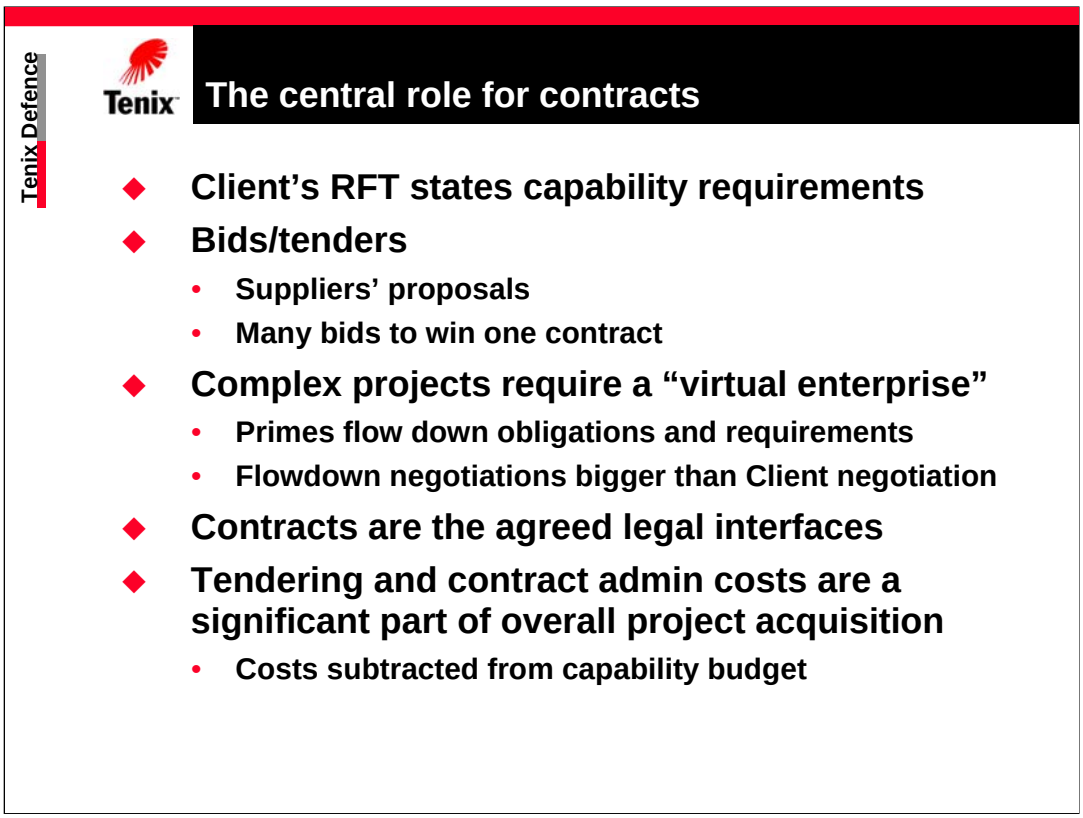
Preparing, administering, circulating and managing the documents required to tender, form and administer Defence's capital procurement projects is exacting and tedious — and costly in terms of cash value, schedule delay and risk to all of the organizations involved. Tenix estimates that documentation costs on the supplier side of the Defence contracting process are at least 1-2% of the total value of contracts won. These costs contribute *nothing* to the actual production of Defence capabilities. If they can be reduced, the savings can either reduce the Defence budget or enable procurement of more capabilities.

Documentation costs added to prime contractors' bid prices include:

- amortised cost of all failed tenders as well as those won;
- contract negotiations and amendments over the project lifecycle (where these are not included directly in the amendment price);
- cost of preparing, administering, circulating, managing and amending documentation for all subcontracts and purchase orders associated with the project; and
- the flow through of documentation cost from all suppliers of their amortised costs for quotes (won and lost), subcontract negotiations and amendments (not rolled up into the price of a prime contract amendment) associated with their participation in Defence projects.

Other more difficult to quantify costs of the Defence contracting process include:

- cost of schedule delay in preparing, administering and circulating documents; and
- risk associated with inadequate preparation and monitoring of the documentation processes to ensure that they accurately reflect Defence's capability requirements.



To build a truly successful system to meet these needs, we need to recognise that contracts represent a central organising theme for a project management or engineering company.

Clients will also make major savings in acquisition costs for their acquisition projects if they also recognise and understand this role.

Defence has a good understanding of costs of the contracting process within its own organisation from unfavourable Auditor General reports on problems encountered with major capital projects, (e.g., Collins Class, LPA, JORN). The Defence Materiel Organisation is addressing many of these issues internally with its business process reengineering and SMART 2000 initiatives, but major Defence suppliers also have similar problems within their own organizations. Although less well documented, the costs of supplier bidding and contract management difficulties will be several times those documented within Defence for the following reasons:

- Defence produces one RFT per project, while suppliers must tender several times to win one project.
- Prime suppliers for major projects need to issue several to many RFQs per tender to Defence.
- Where Defence negotiates and amends one prime contract, prime contractors negotiate and amend several to many subcontracts.

Costs of all supplier tender and contract documentation inefficiencies and difficulties are factored into their bid prices for Defence contracts and contribute nothing to the capabilities delivered. SMART 2000 will have some spin-off improvements for suppliers, but to be fully effective, targetted solutions still need to be developed on the supplier side of the contractual interface.

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Contracts as a knowledge mgmt interface

- Client requirements for a product should be distilled into content of a contract
- Most supplier activities relate back to satisfying the contractually specified requirements
- Essential management systems on both sides need to be tied into the interface
- Requirements for the interface

- Correct
- Available
- Useable

- *Faster*
- *Better*
- *Cheaper*

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Known Department of Defence issues

- **Australian National Audit Office Reports**
  - Jindalee Operational Radar Network Audit Report No.28, 18/06/1996 - http://www.anao.gov.au/Web/wsPub.nsf/AuditReportByTheme/86BC064DE7D158F04A25690A002479D2
  - New Submarine Project Audit Report No.34, tabled 24/03/1998 - http://www.anao.gov.au/Web/wsPub.nsf/AuditReportByTheme/5DE86D19FAEF672A4A2569060003FAC7
  - Management of Major Equipment Acquisition Projects Audit Report No.13, 11/10/1999 - http://www.anao.gov.au/Web/wsPub.nsf/AuditReportByTheme/63BAD5F0473289024A256900000D4D46
  - Amphibious Transport Ship Project Audit Report No.8, 07/09/2000 - http://www.anao.gov.au/Web/wsPub.nsf/AuditReportByTheme/F154BF0971FB9BD5CA25695D008091FC
- **McIntosh/Prescott Collins Class Sub report**
  - http://www.minister.defence.gov.au/1999/collins.html
- **Defence Efficiency Reform Program**
- **Australian Defence and Industry Strategic Policy Statement (1998)**
- **DAO ⅄ DMO Reorganisation**

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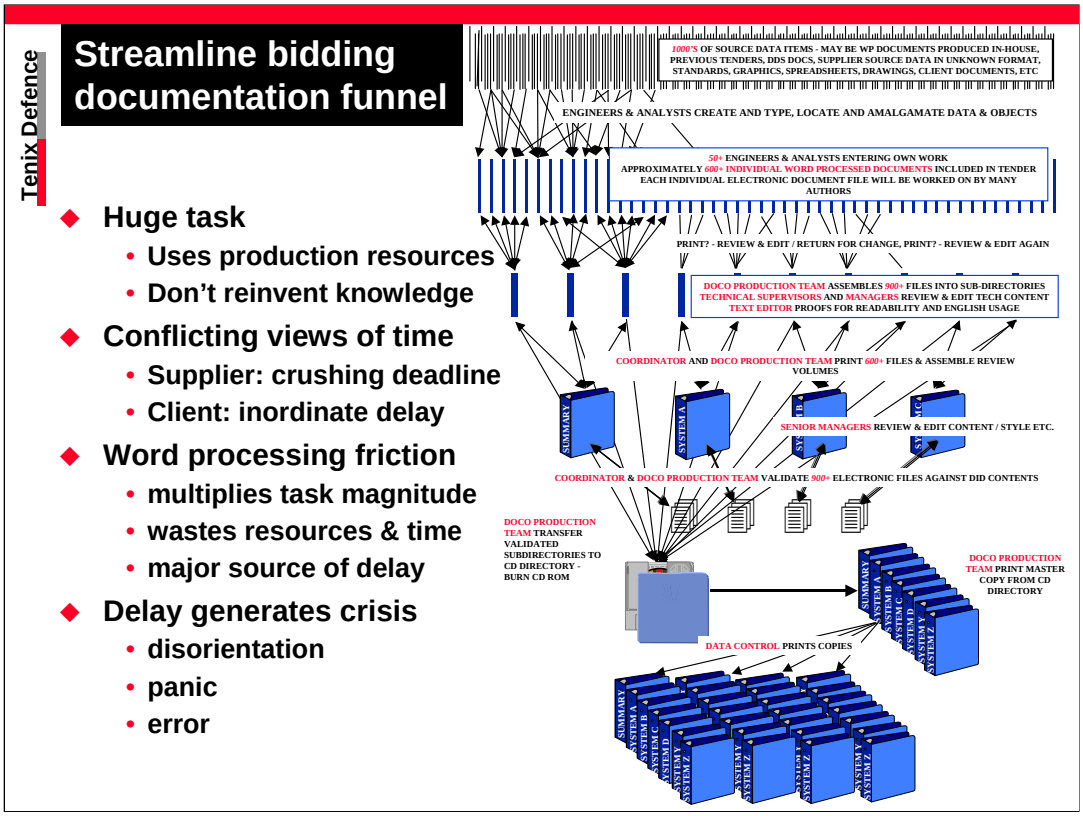
Prime contractor production/mgmt issues

- **Effective contract management critical to business**
- **Prime contractor multiplies all process inefficiencies many times over!**
  - **Customer presents ideas, supplier must offer solutions**
  - **Tenders won must pay for all lost tenders (× 10)**
  - **One contract flows down to many subcontracts (× 100)**
  - **Comparatively unskilled authors (x 2)**
- ***Client pays for all suppliers' inefficiencies!***



Probably the most problematic and costly area for knowledge flow through the project cycle is in the request and bidding stage. The diagram explains why.

Beyond this, it must be understood that the inefficiencies in each and every bid have to be amortised and charged by suppliers to the projects they actually win. Every supplier will lose several bids for the few that are actually won.

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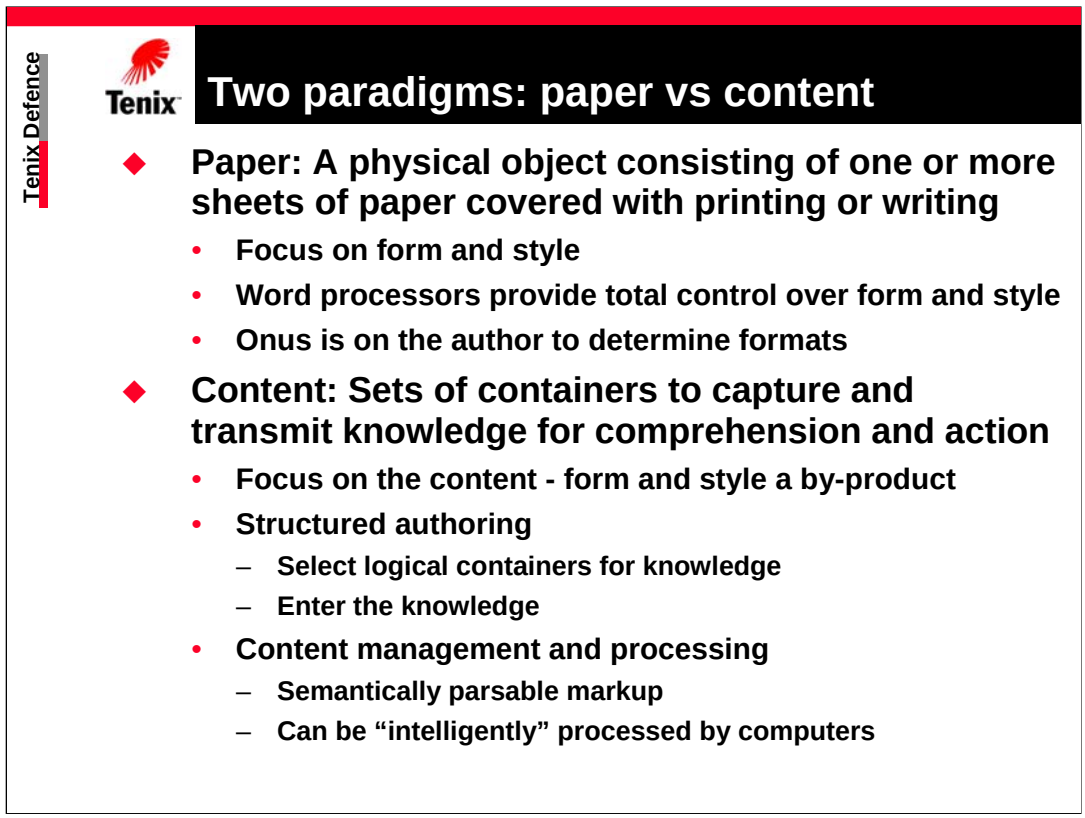
Process improvement

- Effective knowledge mgmt maximises efficiency
- Conceptual tools
  - Query and discovery
  - Structured/controlled authoring environment
  - Electronic routing
    - review
    - approval
    - tracking and reporting
  - Links to source data
  - Change management and tracking
  - Links to other business processes
    - requirements analysis
    - awareness
  - Establishment and reuse of precedents



Format-oriented documentation technology (e.g., word processors like MS Word) focuses conceptually on producing pages, which in most cases are still circulated and administered as physical documents that must be read and responded to page by page. Even though word processed documents are created in an electronic storage environment, the process for producing and managing the paper output has changed little since the origin of writing on paper. Word processors are still being used primarily as typewriters to produce attractively formatted paper. However, the explosive growth of the World Wide Web since its inception some 8 years ago was enabled by and has in turn driven the development of new kinds of documentation technology. This new technology offers the possibility to reduce costs, schedules and risks involved in the preparation and administration of contract related documentation processes by a factor of two or more.

The major new technology enabling these reductions are tools to author and work with "structured" documents.

In some regards, structured authoring tools resemble word processors. However, rather than encoding the appearance of words on paper, they encode text in terms of the structural role(s) each block of text plays in the logical structure of the document. Since establishment of the Standard Generalised Markup Language (SGML) in 1986, the coding schemes used in such applications have followed open (i.e., non-proprietary) international standards to greatly facilitate the transfer and use of textual content across a wide range of applications. The current standard, eXtensible Markup Language (XML), is an SGML derivative optimised and simplified for the World Wide Web. A community of organisations can define structural codes within an SGML or XML Document Type Definition (DTD) that meets their particular requirements for managing documentary information. In such systems, formats are applied automatically to the logical structure of the document as required without involving or impeding document authors. Authors focus purely on the logical structure and content of what they write.

Because authors are no longer troubled by formatting issues, their productivity is substantially higher than when working with format intensive word processing applications like MS Word. Because structured text is easily parsed, it is also easy to build computer applications to fragment, display, distribute, or repurpose text as required in automated validation, tracking, review and amendment processes. Many processes that are today carried out sequentially by physically circulating paper folders — with everything that this entails in terms of "paper chases", can be automated, allowing the parallel electronic circulation and tracking of specifically targeted document fragments. People still must read and act on the texts, but the reading can be much more targeted and the fully trackable circulation can be completed very quickly. Based on Tenix's experience with similar technologies for the authoring, administration and production of ship maintenance documentation, these "structured" methods can reduce authoring labour requirements by more than 50% and review and signoff cycle times by 80-90%. The technology also provided very substantial improvement in the quality and reliability of document content. Still more savings can be achieved by facilitating reuse of corporate knowledge across more than one stage of a project or across several projects.

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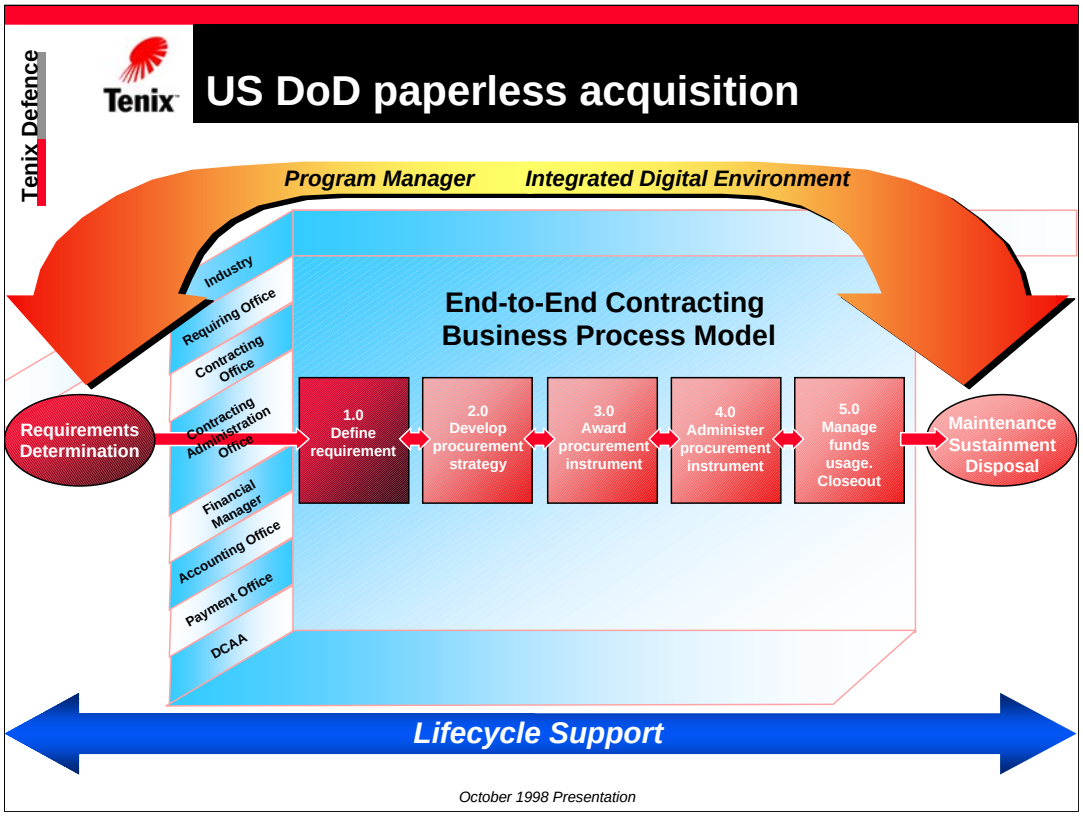
International efforts to implement paperless contracting



The problems and costs to develop contracts are recognised around the world. The US Department of Defense has developed a paperless contracting process based on a bespoke mainframe/remote access solution.

This is the wrong solution to the problem!

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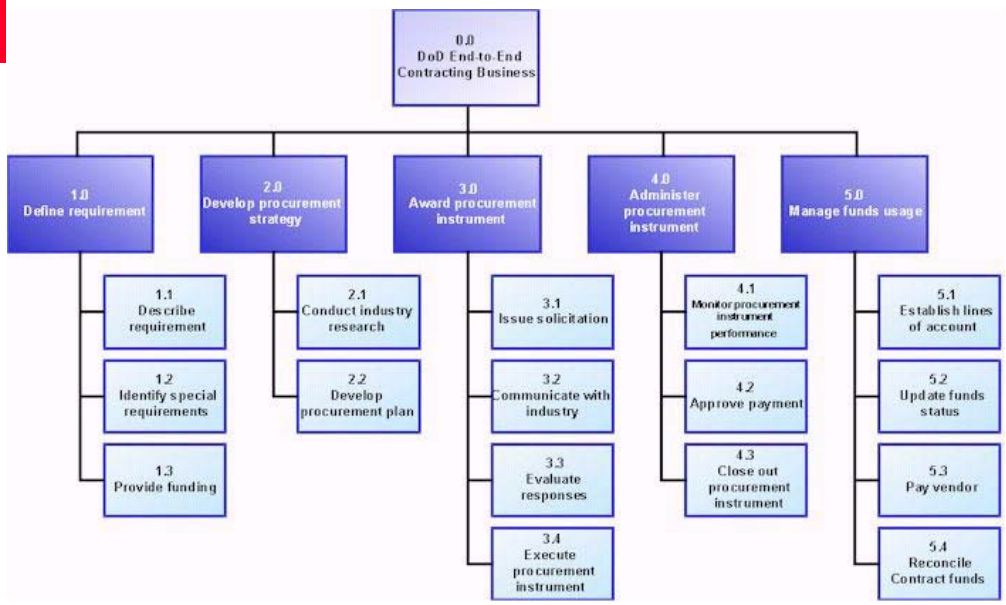
Functional analysis



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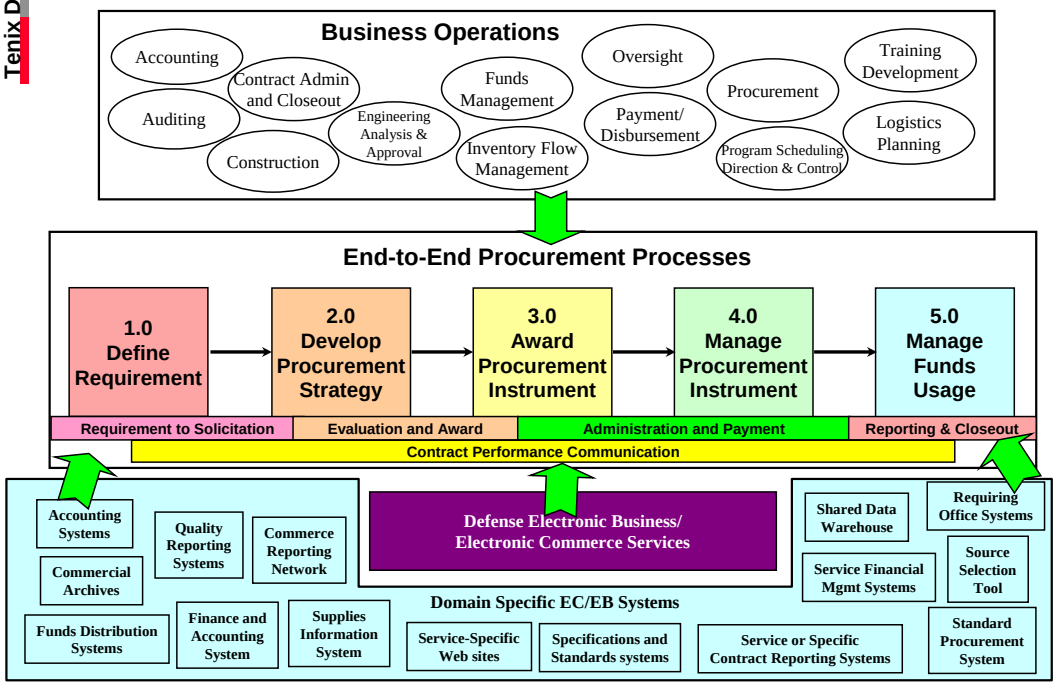
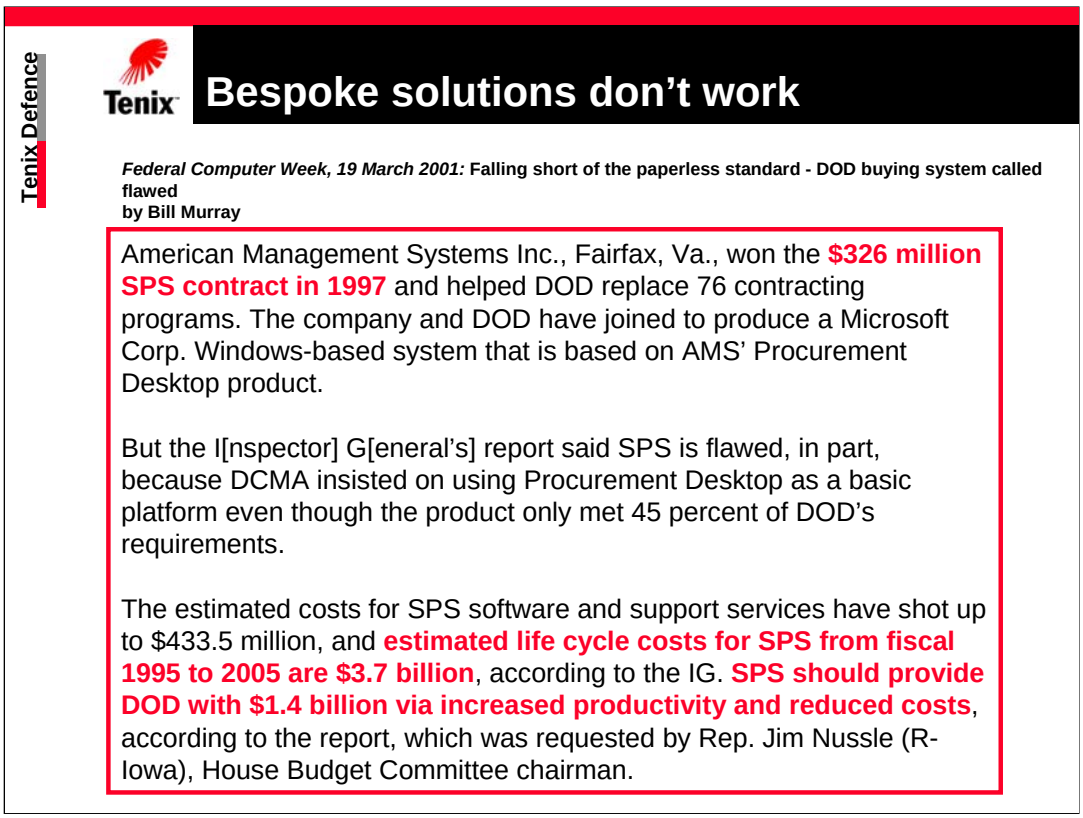
What is involved in paperless contracting





What we need are standards based solutions, that will facilitate the development of a range of client and supplier solutions that can more easily cater to the unique requirements of each individual organisation.

I believe that what is needed is development of a set of XML standards for contractual documents that can be readily implemented and processed by general purpose content management systems such as SIM, which Tenix already has.

This is being facilitated by an international organisation, LegalXML - which already has an active Australian branch which includes a number of members who are currently working on the means to express contracts in XML.

For several hundred thousand to a few million dollars, we can put together a demonstration project to test and prove the value of this kind of approach.

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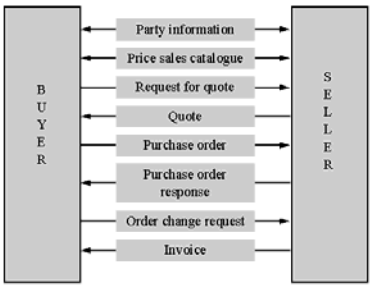
XML-based contracting initiatives

- **Frontline Solutions for XML In Defence Procurement** (http://www.frntln.com/index.htm)
  - EZ-RFP for USAF
  - XML authoring for RFP's but no published standards
  - Summary paper: XML in Defense Procurement (http://www.infoloom.com/gcaconfs/WEB/chicago98/harshbarger.HTM)
- **ebXML** (http://www.ebxml.org/)
- **UN/CEFACT** (http://www.unece.org/cefact/)
  - Legal Working Group
  - UN/EDIFACT (http://www.edifact-wg.org/)
- **LegalXML Organisation** (http://www.legalxml.org/)



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Melbourne's World Leaders

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- **Australia's largest defence prime contractor**
  - Manages/subcontracts single project virtual enterprises
  - Small enough to be a centre of excellence, not islands of competence
  - Seeking generic solutions not just quick fixes
  - Committed to locally based R&D
- **Committed to implement state of the art content management systems**
  - 1988 R&D project focussed on content mgmt technologies
  - RMIT's Structured Information Manager (SIM)
  - DOORS requirements management
  - STEP "Spider" project
  - SpeedLegal SmartPrecedent management system
  - Configuration management issues

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Manufacturing Systems and Automation

- **Located within CSIRO Manufacturing Science and Technology (CMST), Preston, Vic.**
- **Relevant relationships**
  - **CRC for Intelligent Manufacturing Systems and Technologies**
- **Relevant R&D projects**
  - **Globeman 21- Enterprise Integration for Global Manufacturing for the 21st Century (http://ims.toyo-eng.co.jp/Index2.htm)**
  - **Globemen - Global Engineering and Manufacturing in Enterprise Networks (http://cic.vtt.fi/projects/globemen/public.html)**
  - **Global concurrent engineering**
  - **Development of business processes and technologies for single project virtual enterprises**
  - **Bidding Workbench**

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RMIT UNIVERSITY

Multimedia Database Systems

- **Relevant relationships**
  - LegalXML (Legislation and Contracts WGs)
  - World Wide Web Consortium (W3C)
- **Relevant research projects**
  - Fundamental research into indexing and managing multi-gigabyte databases (http://www.mds.rmit.edu.au/mg/)
- **Structured Information Manager** (http://www.simdb.com/)
  - World class native XML database engine
  - World class Web server, document management services
  - World class application development technology
- **Significant clients**
  - Management & delivery of legislation (http://www.thelaw.tas.gov.au/)
  - Defence security agencies in US and Australia
  - ATO Legal Database (http://law.ato.gov.au/atolaw/index.htm)

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SpeedLegal Pty Ltd

- **Independent legal software developer, Queen St., Melbourne**
- **Significant relationships**
  - **Legal XML Contracts WG**
  - **CCH Australia/Wolters Kluwer Pacific**
- **SmartPrecedent**
  - **XML based precedent management and intelligent authoring system**
  - **Round trip between XML and RTF**
  - **Based on a DTD for the structural hierarchy of contractual documents**

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Australian Industry Defence Network

- **Industry assoc. for small and medium enterprises contracting to Defence and defence primes**
  - Supported by Department of Defence and state development organisations
  - ~700 members
  - Works to reduce cost and effort to bid for defence work
- **eCommerce Committee**
  - eCommerce standards development and testing
  - Process improvement using Web technologies
  - Education and outreach
- **Greatest strength located in Victoria**
  - President
  - eCommerce committee membership

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Other players

- **Defence Materiel Organisation**
  - Contracting Policy and Operations (direction)
  - Business Information Systems (technology policy)
  - Defence eProcurement Directorate (oversight and contact)
  - Materiel Reform (Smart 2000 precedents development)
- **Distributed Systems Technology Centre**
  - Hosts Australian W3C office
  - Centre for ebXML work in Australia
  - Knowledge and resource management
  - B2B processes and work practice support
- **Legal XML/Contracts**
  - Commitment to “open source” publication of findings
  - Clearinghouse for world knowledge on XML for contracts

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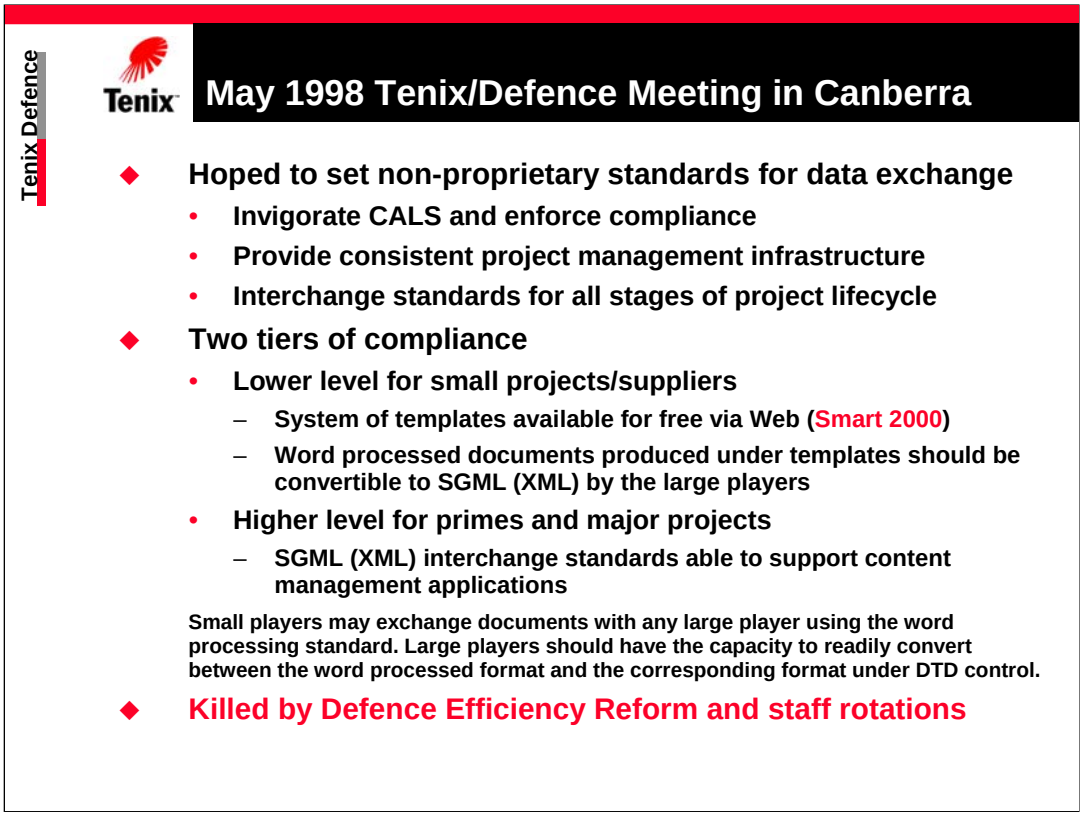
Historical development of the RACE Online Project

RACE Online is the name of a consortium of Australian Defence industry organizations and knowledge management system developers formed to test and demonstrate improved technology for managing the textual content of defence project related tender and contract documents. RACE is an acronym for Requirements and Contract Engineering. Initial members of the consortium include:

- eCommerce Committee of the Australian Industry Defence Network, the Defence industry organisation formed to represent small and medium Defence suppliers
- Tenix Defence — Australia's largest Defence contractor
- Manufacturing Systems and Automation (MSA) Group in CSIRO's Division of Manufacturing Science and Technology — concerned to test and demonstrate technologies and business processes to facilitate single project virtual enterprises (e.g., as exemplified by the kinds of teams assembled to complete major Defence projects)
- Multimedia Database Systems (MDS) of RMIT University — developer of highly capable Web-based knowledge management applications; and
- SpeedLegal Pty Ltd — a Melbourne developer of a precedents based contract authoring system.



What Do We Hope to Gain?

Once structured documentation technology is established in the market, Defence can reasonably expect to substantially reduce delays between its decision to acquire a capability and actually begining to produce that capability. Reduced delays and contractor document processing costs should also be reflected in reduced acquisition costs. If Defence adopts structured document content management applications internally and processes based on them, its requirements tracking and project monitoring capabilities may also be improved.

Large enterprises/prime contractors implementing full content management systems should be able to either reduce their RFT response costs or devote more effort to producing better bid documentation. Such enterprises should also be able to substantially reduce the cost and schedule requirements to complete supplier quotation and subcontracting processes. The technology will also very substantially improve the flow-up of potential supplier information into bids, and the flow-down of client requirements into subcontract documents. The technology will reduce project costs and schedules, and substantially reduce risks due to documentation production errors or failures to adequately track documentation changes during the negotiation and amendment phases.

Smaller suppliers may be able to quote and negotiate contracts and sales online via the Web without any requirements to implement any technology more complex than a Web browser, to eliminate all costs and delays in the bidding process except those directly associated with establishing the price to quote.

The consortium believes that the technology and processes it wishes to demonstrate will be able to reduce the labour costs and procurement cycle times of existing processes based on format-oriented word processor production of paper documents by at least 50% while at the same time reducing risk through enabling better quality control and management of the documentation work. If the conservative estimate that the existing processes add at least 1% to Defence capital project acquisition costs (which are on the order of $3 BN per year), such reductions would minimally save the Australian Government and taxpayers more than $15 M per year. By minimising the risks of major project cost and schedule overruns such as occurred with the Collins Class subs, JORN and the Landing Platform Amphibious ships, actual savings could be several times this amount.

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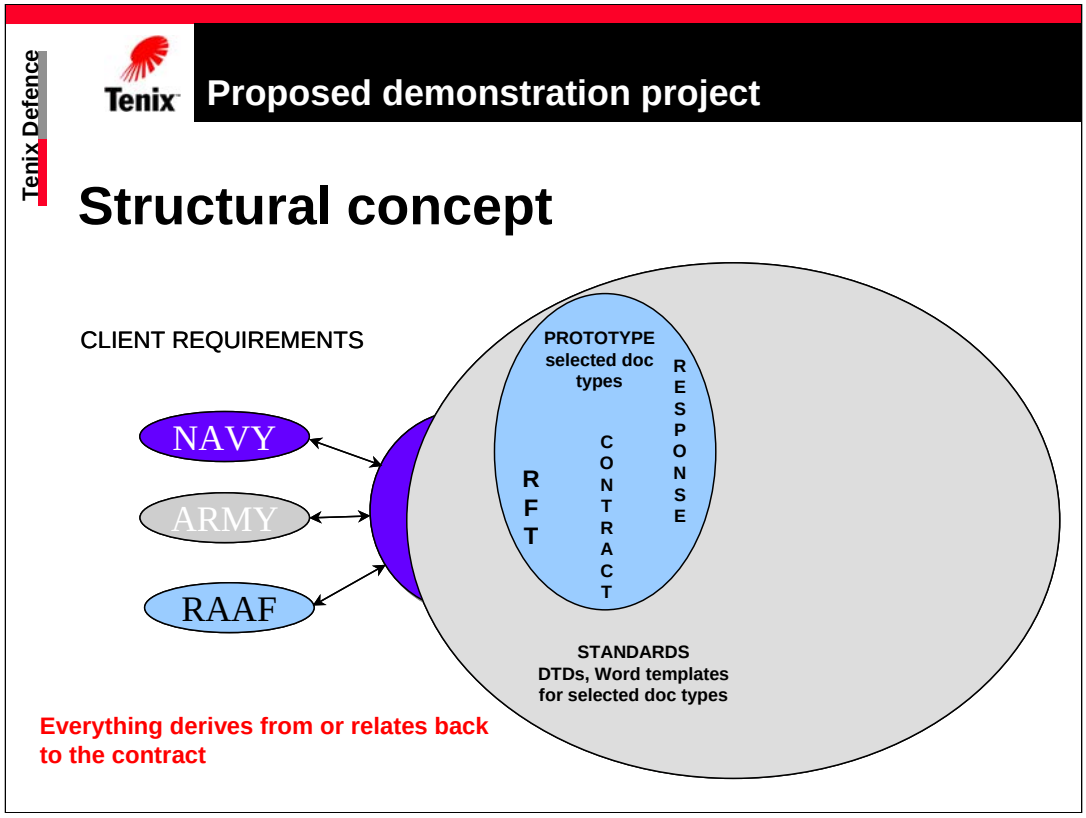
Second half 1999

- **Tenix began implementing RMIT's SIM**
  - Targeted ANZAC Frigate maintenance procedures
  - Prototyped many of the source data and change management capabilities needed for bids and contracts
- **Drafted a Capability Technology Demonstrator Proposal with CSIRO help**
- **Explored joint research proposals with RMIT**
- **Conditions still not suitable to start work on legal documents**
  - Some technology still required development (costly)
  - Continued difficulties identifying Defence contacts
  - Tenix management still wasn't committed



•Structural concept

The demonstration project seeks to prototype the flow of information from DAO requirements development/tracking, through RFT, prime contractor requirements tracking, response, and contract.

To contain costs, the demonstration will be limited to a subset of document types (say DIDs and Conditions) which already have well defined requirements- related structures. The number of documents to be included in the subset will depend to some degree on the available budget

However, to test and demonstrate applicability of the technology to small projects and suppliers as well as large organisations possessing DCMS capabilities, DTD-derived MS word templates will also be developed for the subset of document types covered by the demonstration project. The latter standards would be used where DAO and/or large suppliers are tendering work to small suppliers.

It is anticipated that all DTDs developed during the project will have broad applicability to a wide range of contracting situations beyond Defence, and the intellectual property developed from the demonstration project should have considerable export potential, even if Defence itself chooses not to adopt and extend the standards.

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Late 2000 - threads coming together

- **ebXML (electronic business XML)**
  - Encapsulates transactions and captures assoc. metadata
  - Does not deal with the content of tenders and contracts
- **AIDN's Spider Project for STEP**
  - Project to demonstrate STandards for the Exchange of Product information (PDM)
  - Established eCommerce Committee
- **Developing involvement in LegalXML.org**
  - Focus on documents not transactions
  - Open source community
  - Worldwide involvement
  - Australia and Melbourne heavily involved

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Enablers for the demonstration project

- **DMO released Smart 2000 precedents**
  - **Standardised and documented structure of major RFT and contract documents** http://www.dmo.defence.gov.au/lsd/smart2000/smart2000.cfm
  - **Based on controlled MS Word template**
- **RMIT, SpeedLegal, Tenix and CSIRO all represented in LegalXML**
- **SpeedLegal's SmartPrecedent provided the missing component**
  - **Database aware editing environment**
  - **DTD for the hierarchical structure of contracts**
  - **Easy round-trip between Smart 2000 and XML content**
  - **Illustrated concepts to Tenix contract engineers**

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NOIE ITOL

- **National Office for the Information Economy**
  - Estab. to help Australians create world-class online economy
  - Included former Office for Government Online
- **NOIE Information Technology Online (ITOL) grants**
  - “ITOL is designed to accelerate the national adoption of business-to-business (B2B) e-commerce solutions, especially by small to medium enterprises (SMEs), across a broad range of industry sectors and geographic regions.”
  - “NOIE defines e-commerce as the use of computers and electronic communications networks as a business tool, which can enhance business efficiency and effectiveness.”
  - Up to $A 200,000 available in matching funds for suitable projects

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RACE Online

Project Plan

- Determine content requirements for defence contracts
  - Start with SMART 2000 contract template and guidelines
  - Interview DMO, prime contractors and AIDN sub-contractors
- Publish a prioritised Requirements document listing bidding and contracting needs of the three parties
- Develop specification
  - DTDs
  - Business requirements
- Publicise for criticism and comment via LegalXML and other open source forums
- Implement a proof of concept/demonstration website
  - Expose supporting software
  - Review and incorporate feedback
- Demonstrate and train through the AIDN membership

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Relationship to other initiatives

- **SMART 2000**
  - Start for SME integration into KM framework
  - Published and tested words
- **ebXML and UN/CEFACT**
  - Encodes transactions not content
  - Concern now focussed on content model
  - Role of DSTC consortium
- **LegalXML/Contracts**
  - Concerned with content models not transactions
  - Provides "open source" publication

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Way ahead

- **Whether the grant is won or lost the initiative needs to proceed**
- **We seek**
  - **Additional members who have something to contribute**
    - **funding**
    - **technical capabilities**
  - **Expressions of interest and support welcome**
  - **Critics and reviewers**