User experience in ASCE plug-in development

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QinetiQ, Fast Jet Evaluation Services (FJES)
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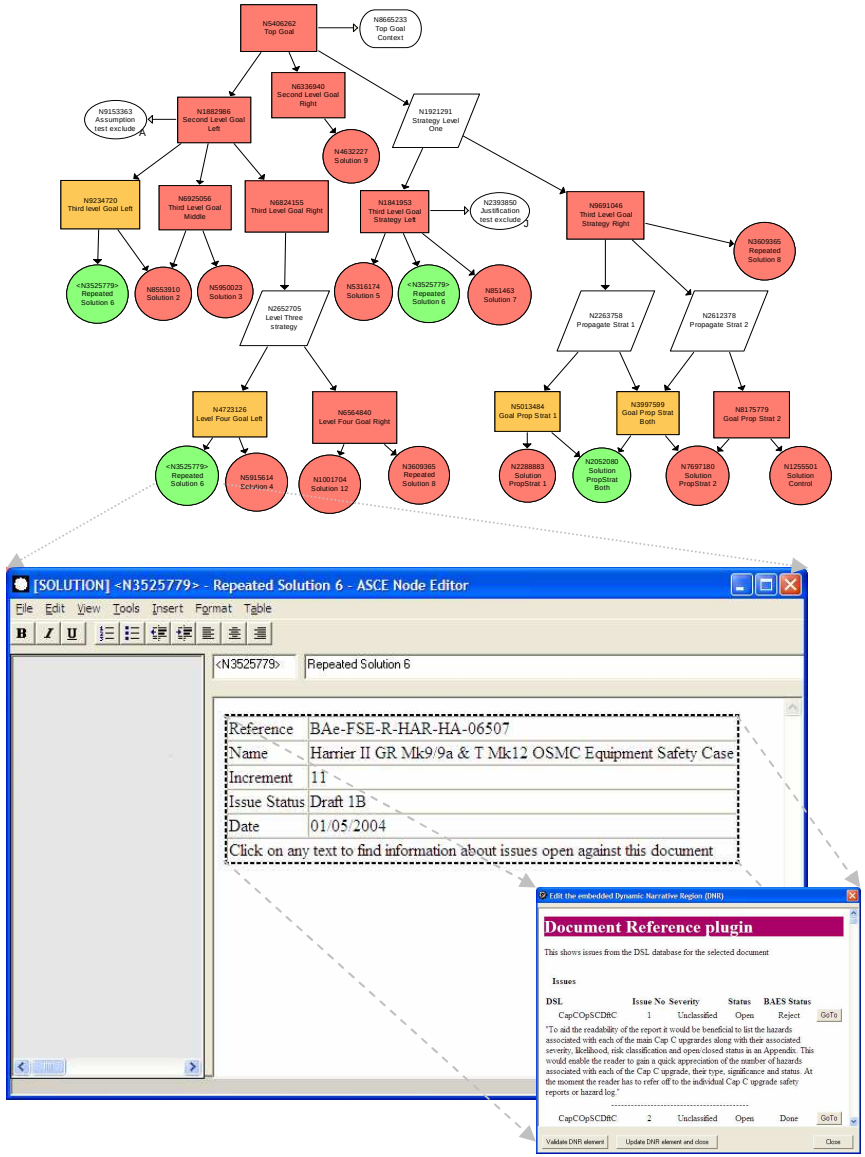

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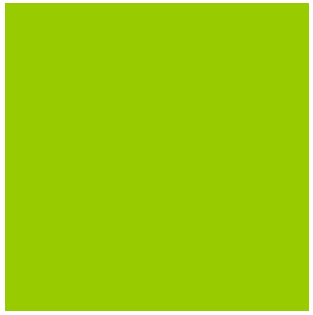


01 Role in QinetiQ - Proven Defence Expertise

The largest of QinetiQ's business sectors, Defence and Technology is a major supplier of innovative technology and managed services to the UK's armed forces and those of its allies through:

MOD Research as the principal supplier of research to the MOD

Technology Supply using IP from customer funded research to provide technology-based solutions to prime contractors, government agencies and OEMs.

Procurement and Capability Support providing advice in relation to acquisitions, sustainment and use of Defence equipment

Managed Services that are generally long-term relationships which have a substantial investment to the programme, involving managing assets owned by the MOD.

01-1 Role at QinetiQ

As a part of Fast Jet Evaluation Services at MoD Boscombe Down.

- Act as part of a team to provide independent assessment of aircraft and equipment safety cases for the Harrier IPT.
- This assessment helps the IPT fulfil their requirement to independently assess the safety case as required by JSP 553.
- Provide advice and recommendations for clearance for equipment with respect to in-service aircraft.
- Act as a trainer for 1 day GSN course licensed from Tim Kelly, York University.

02 Background

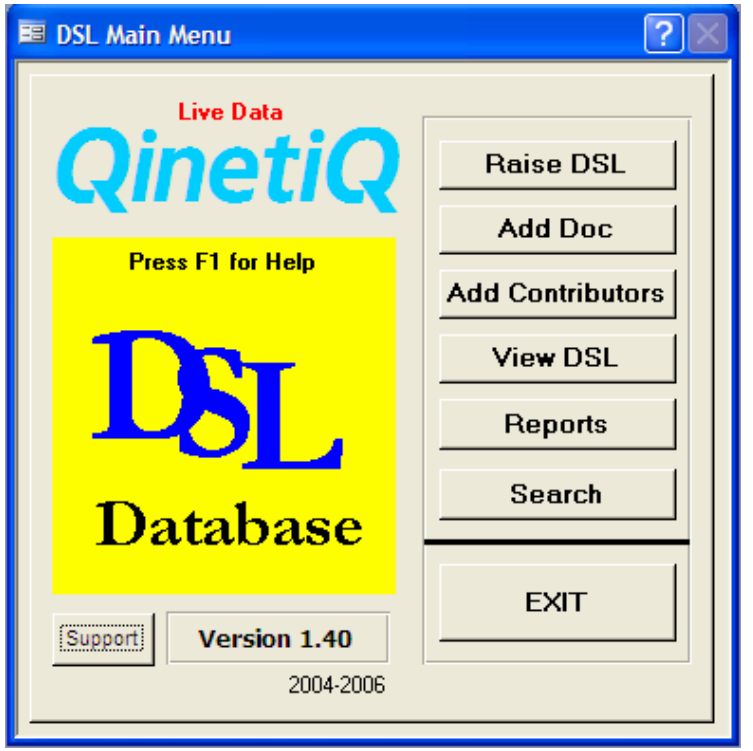
With reference to development of ASCE plug-ins my previous experience helped in a few areas.

- ASCE Tool Experience
  - Use of ASCE since version 2 upon arrival at QinetiQ and post GSN training. Primary use is the construction of GSN arguments although also have experience in using Why-Because graphs.
  - No formal training in use of tool but consider myself a competent user based on experience and reference to available documentation.
- Programming Experience
  - Previous experience in a number of languages / notations
    - Java, JavaScript
    - Visual Basic for Applications, VBScript
    - Perl
    - HTML/XML

03 Motivation

Development of plug-ins motivated by a number of factors:

- Exploit in-house database.
  - Keep track of issues raised against safety argument in different documents.
- Assess completeness of evidence.
  - Linking GSN solutions to the resolution of issues raised.
  - Desire to easily manage repeated solutions on a large GSN.
  - Give ‘at a glance’ status of an argument presented as a GSN network
- Personal curiosity about the usefulness / power of the plug-in model.



04 Initial Resources

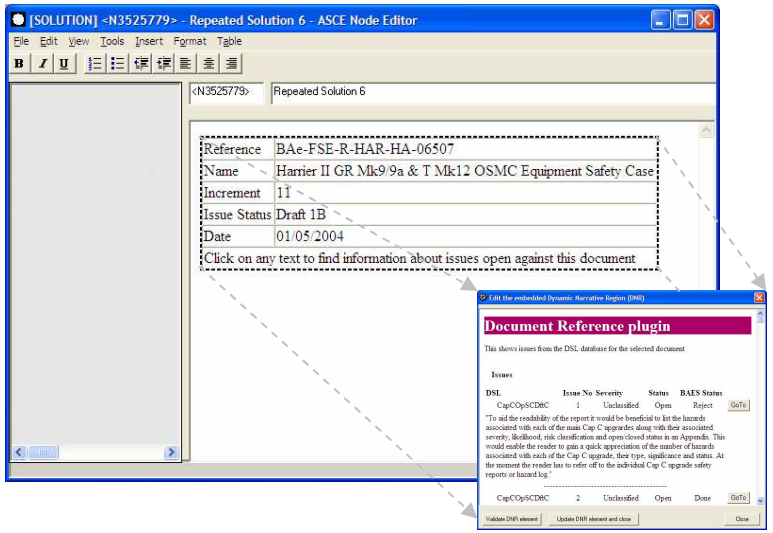
Useful sources of information during early development of the plug-ins

- Adelard plug-in documentation
- Example plug-ins developed by Adelard
- VBScript Programmer's reference 2nd Edition, Kingsley-Hughes, Read – Wrox
- Access database design & programming 3rd Edition, Roman – O'Reilly

05 DSL Database Plug-in

First attempt at a plug-in which was driven by the desire to exploit information held in an in-house database.

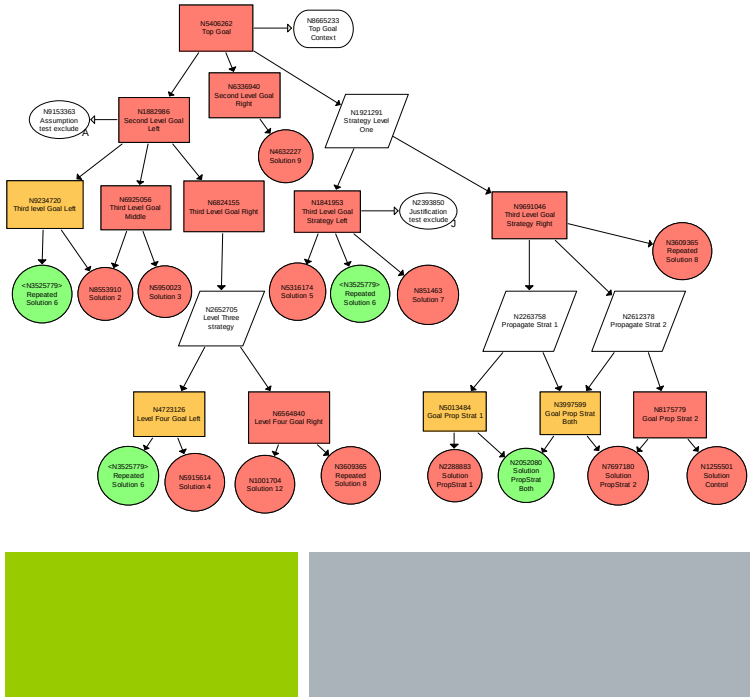
- Based on '*basic access and excel plugin v0.2.xml*'
- Functionality based around the Dynamic Narrative Region and HTML forms
- Plug-in functionality
  - Insert document reference in a DNR for easy access to open issues.
  - Display list of open issues and their status.



06 Goal Completed Plug-In

After experience gained with DSL database plug-in, an attempt was made to exploit the power of node statusfields.

- Useful information
  - Previous knowledge of recursive algorithms
  - Example tree navigation in Adelard plug-ins
    - *'gsn auxilliary functions v0.2.xml'*
    - *'one click export v0.1.xml'*
- Functionality
  - Show status of GSN based on completed status of solutions (evidence) using colour
  - Manage repeated solutions as one entity
  - Controls to change status of tree
  - Nascent function to manage progress



07 Issues encountered

During development of the plug-ins, some issues arose which are worth mentioning

- Difficulties in understanding
  - **Understanding call-back functions and attributes embedded in HTML of DNRs**: Quite a bit of trial and error needed to fully understand how various tags worked between calls to the DNR.
  - **Non-intuitive naming of links collections**: It was assumed that *inlinks* were arrows pointing into the node and *outlinks* were arrows point out of the nodes. The situation is actually
    - *inlinks* are those that originate **IN** the node and point out
    - *outlinks* are those that originate **OUT**side the node and point in
- Security
  - VBScript allows access to the registry and local/network filesystems. Useful and powerful functions which are both used in the plug-ins.
    - ***WScript.Shell*** object allows access to RegRead(), RegWrite() and RegDelete() methods
    - ***Scripting.FileSystemObject*** allows full access to the local and network file structures

08 Summary & Suggestions

- Goal Completed plug-in available on the Adelard website.
- DSL plug-in only of use for in-house applications so not released

Suggestions

- Enhance documentation on DNRs to include a worked example walking the user through typical functioning of the HTML attributes.
- Enhance documentation for PublicScriptableMethods with examples
- Scan plugins for possibly dangerous code and give a warning on initial use of the plugin along with the signature message.
- Users should in the meantime examine 3rd party code for possible misuse of *Shell* and *FileSystemObject* objects before using the plug-ins.

Questions ?

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