

## Qualitative Data Analysis Software: NVivo

NVivo qualitative analysis software is developed, supported and distributed by QSR International Pty Ltd ([www.qsrinternational.com](http://www.qsrinternational.com)). A single commercial licence costs US\$735 and US\$445 for educational use. QSR offers product maintenance for US\$140 (commercial) and US\$85 (educational).

As a long-time user of Atlas.ti I have a particular interest in software that supports practical social research applications and which goes beyond the traditional textual analysis by enabling visualisations. NVivo is a product that does this by enabling the creation of mindmaps and cause-effect networks.

### Getting Started

NVivo utilises a Launch Pad on start-up (see Figure 1). The Launch Pad forces the user to select from 'Create a Project' or 'Open a Project' to use the product. This is a frustrating feature and seems unnecessary.



Figure 1: NVivo Launch Pad

Once a project is opened (see Figure 2), several "windows" are displayed, including the 'document explorer' and the 'node explorer'. NVivo uses the term 'nodes' rather than 'codes' – the 'node explorer' is used for coding and managing nodes. The user is unable to customise the way in which these windows are displayed and therefore must arrange them on the screen each time a project is opened. It would be useful to have an option to save a preferred arrangement of the windows or to open a project at the previous screen layout so the researcher is able to continue where he or she last worked.

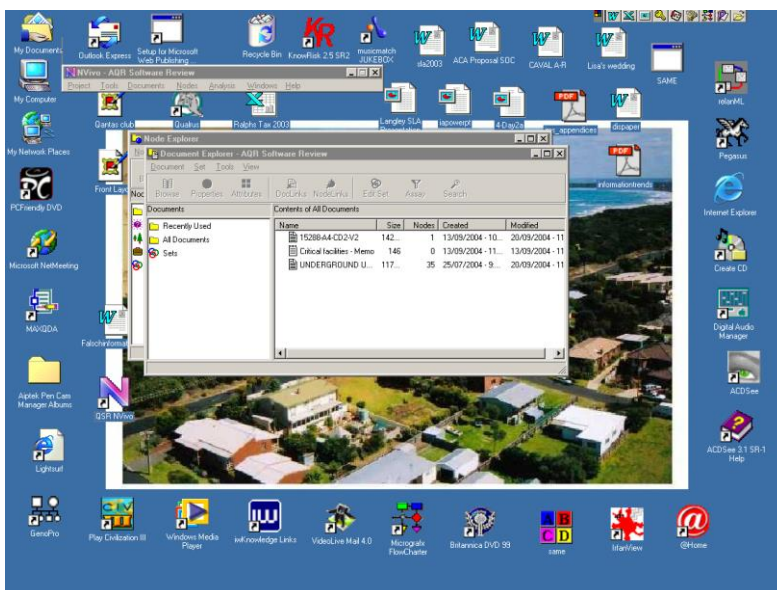


Figure 2: Initial layout when opening project

## Creating documents

Creating documents in NVivo is a simple exercise and there are several ways in which this can be done.

Rich text format (RTF) or text only files that have had all embedded objects removed, including tables and images, can be imported into NVivo.

Proxy document files can be created to represent and link to other file formats, for example audio, video and image files, etc. The user must then develop a system to match the nodes with file e.g. tape count, and/or by inserting comments or a summary for coding purposes. This process is cumbersome, and as improvements are made to this product it would be beneficial to be able to bring in directly other file formats for direct coding.

As documents are created in the document browser, documents can be grouped into 'sets'. This feature enhances the analysis, search and concept management processes of specific themes, issues or other groupings. This feature can also be applied during the coding process.

In the screen view below (see Figure3), the 'document browser' is open to view a document. Which other windows the user has open will depend on the features being used. The user has many options for arranging the required windows. This seems to make the task of using this software over-complicated, but the rationale seems to be one of tailoring the screen view to the task at hand. I would suggest (and this also applies to Atlas.ti and Qualrus) that using a LCD screen equivalent to a 17inch or larger is necessary to enable one or all of the arranged windows to be visible and usable.

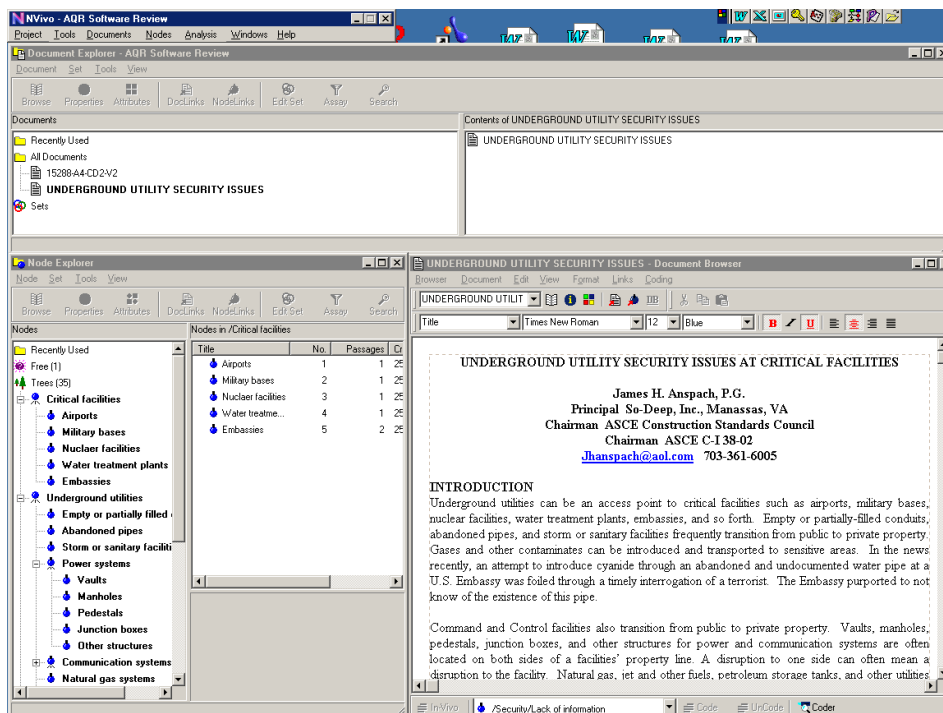


Figure3: Example of a screen layout used.

In their documentation, QSR recommend that those windows not in use are minimised with only the window in use fully displayed. Users may find the process of constantly minimising and maximising screens on a regular basis quite difficult, particularly if they are used to using other qualitative analysis software that offers a fixed layout that displays both the coding and the document browser during the coding process.

## Coding Process

This section covers some of the tools that can be used in the coding process.

There are several ways to create nodes in NVivo. One way (see Figure 4) is by using the node explorer. Within this window, for example, clicking on 'Tools', and then 'Create node' can create nodes or 'Create' (for a child or sibling node) depending what is highlight in the explorer. The user can also right click on a node and go through a similar procedure.

As nodes are added to the explorer, the user can develop and assign attributes to the nodes, develop node hierarchies (e.g. around themes), adding context and so on.

The development of the node hierarchy is an important aspect of the coding process as it forms the basis for developing visualisations later in the analysis.

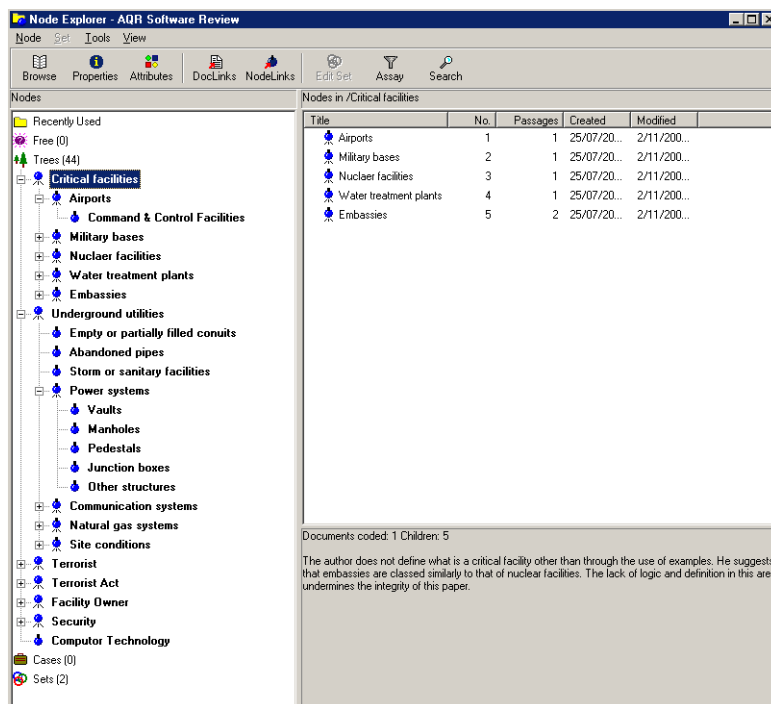


Figure 4: Node Explorer

Nodes can also be created by opening the 'document browser'. Figure 5 shows the 'document browser' open with view that displays where the nodes have been assigned to words, paragraphs or sections of the document ('coding stripes') using the 'coding bar' at the bottom of the screen. This feature makes the assigned codes visible but this is only a display and does not offer any other functionality. To check on the node to see where else it is coded or what the user has written about it is done in 'node explorer' which means that the user must open another window. Nodes can be isolated in the 'node display' to track or explore how a particular node is addressed. This is very useful when exploring a particular theme or idea.

Another feature within the 'document browser' allows changes to be made to the document. This is useful, particularly early in the coding process when reading the document as the user can do a colour 'highlight' of the text that the user considers relevant to the analysis. It also means that the user can be creative in developing memos. Memos are created by using the 'Link' feature that enables the creation of a new document as a memo which is then linked to a particular location in the core document. This enables the user to keep track of where ideas first emerged during the initial reading of the document.

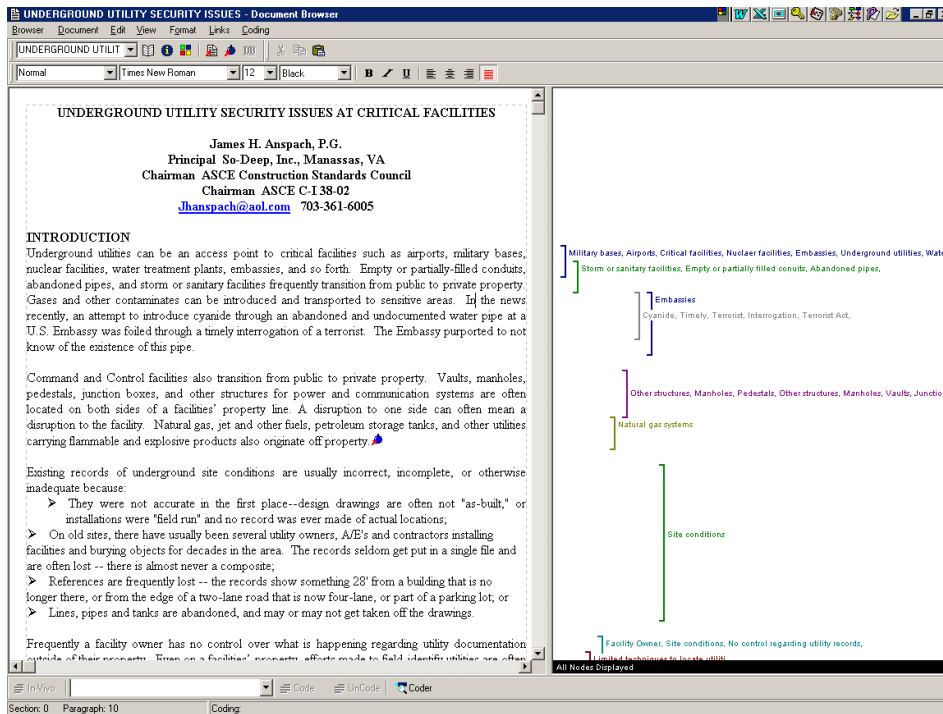


Figure 5: Document Browser with the "coding stripes" view opened.

An interesting aspect of NVivo is that all of the documents created, whether they are files that have been imported or those created by the researcher in the form of memos, can be linked to any other part of a document, another document or node. Memos can be treated as documents and consequently they can be searched and coded.

Figure 6 shows the tools that allow attributes to be added to the nodes. The attributes are simple to create and assign to each node. Attributes can be used to help focus searches or to explore documents and nodes to identify any patterns (using the 'array' tool) that may be useful to the analysis.

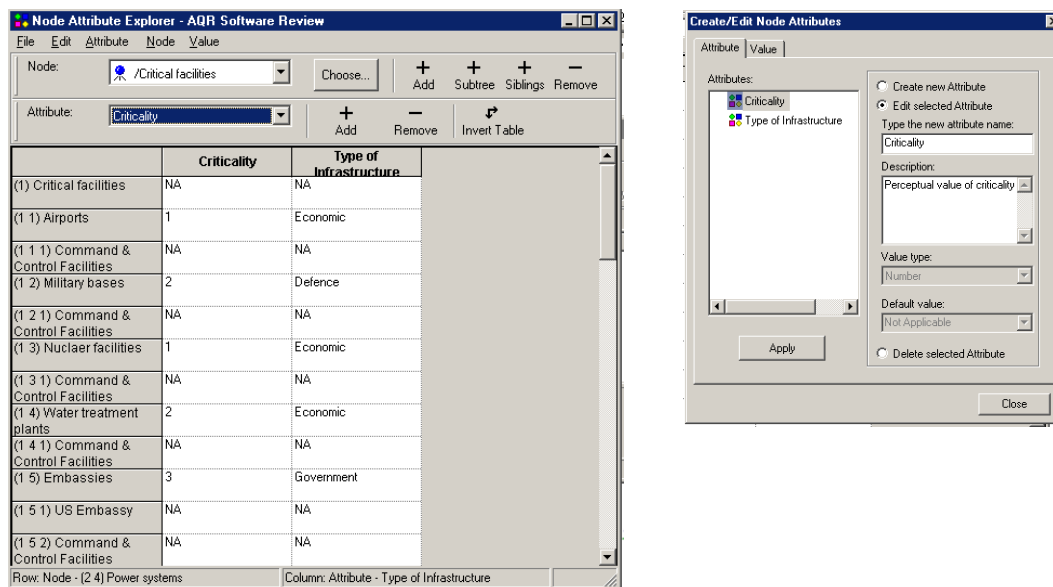
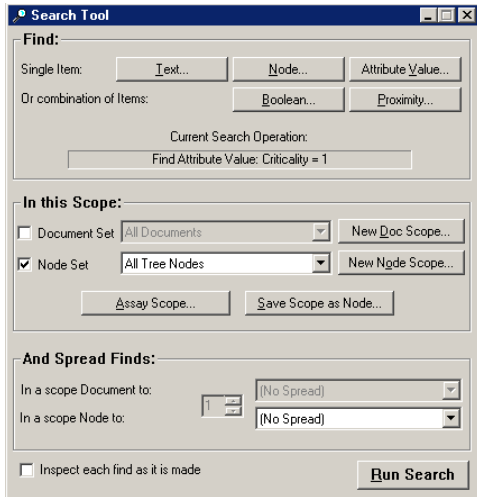


Figure 6: Node Attribute Explorer and Create/Edit Node Attributes Windows

The 'search tool' (see Figure 7) highlights the many ways to find and explore text, nodes and attributes across the specified set of documents and nodes.



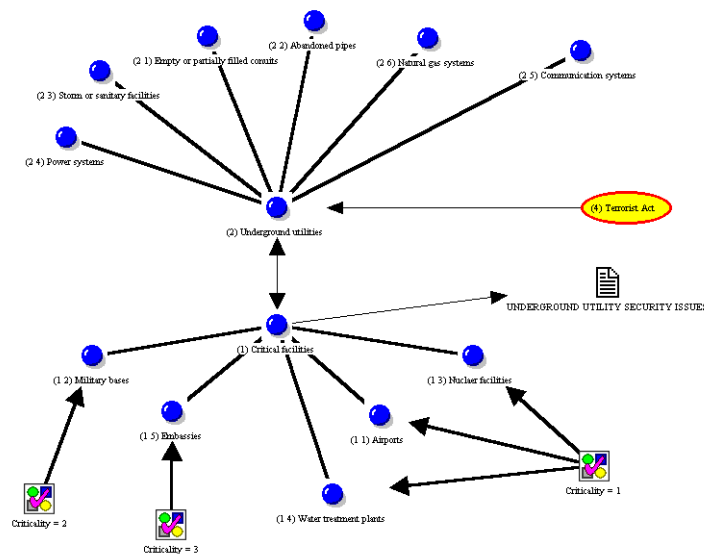
**Figure 7: Search Tool**

## Model building

Visualisations (like that shown in Figure 8) are a useful way to explore and explain relationships between various nodes, documents and memos, etc. The user can open the 'model explorer' and create models to explore ideas, evolving theories and hypotheses. Adding nodes to the model is simple and the user can choose whether or not to include the nodes descendants. This highlights the importance of setting up the appropriate hierarchical structures in the 'node explorer' (see Figure 3). Adding links between nodes or over objects in the model is also a relatively simple exercise. As the model is developed over time, the user has the option of creating layers to see how the model was developed over time or to reflect on different ways the relationships can work (context).

The relationships established in 'model explorer' are unique to a particular visualisation (model) and are not carried forward to other models being developed. The user needs to be aware that this differs from other visualisation tools where these relationships are maintained. NVivo relies on the user maintaining the hierarchical structure (child/sibling relationships) in 'node explorer' for this and allows the user to explore relationships under different contexts.

Other features can be added to the visualisation, such as attributes, representation of documents or memos to provide context or meaning to concepts being explored.



## **Figure 8: Visualisation relating underground utilities and critical infrastructure**

### **Summary**

As a tool to support qualitative analysis by enabling visualisations to be created, NVivo is in the similar class as Atlas.ti and Qualrus. It is interesting that each of these tools uses different techniques to code, create memos, develop and modify their visualisations, etc. and as such, the user needs to be aware of these varying techniques and of the implications of the variances for his/her personal style and proposed research methodology.

Because of the design and layout of this tool it is not as intuitive as it could be and requires a fair amount of experimentation before the user becomes familiar with the inner workings of this software. This places greater emphasis on reading the manuals and maybe for some, undertaking training to get the best use out of the tool.

NVivo is part of a broader product range that allows sharing and merging of data. For the purposes of this review, NVivo was examined as a stand-alone product and overall, is a tool that needs to be considered when deciding which qualitative analysis software best suits the user's needs.