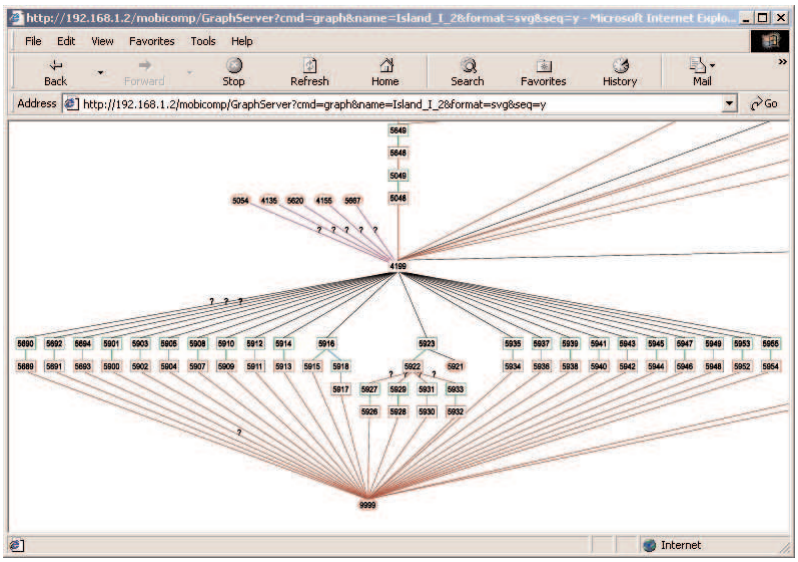
Tool for Stratigraphic Data Recording

The idea that the features of an archaeological site are to be found in a **stratified state**, one later layers or features on top of theabove otherearlier ones, is of first importance infundamental to their investigation of these sites by archaeological excavation. However, as these stratigraphic data are bound to disappeareach layer is removed as theas the process of excavations proceeds, accurate visual records are crucial in order to for studying the finds within their context, and to allowing for later reassessment where necessary. The EPOCH network will is developings a new state-of-the-art tools that canto assist archaeologists in the systematic recording and interpretation of their excavations.

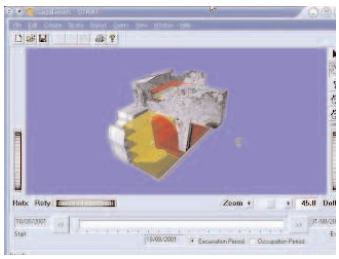
A widely used archaeological method for representation, and analysis and correlation of stratigraphic data is through the **Harris Matrix approach**. However, this approach does not provide any 3D information, a 2D diagram showing the sequence of deposition of layers. A In contrast, a 3D view visualisation of a site enables easy comparison between adjacent layerslayers close to each other to be easily compared based on according to their physical attributes providing more information to aid in the correlation of the layers. Archaeologists wish to have the benefit of using both forms of visualisation. Thus aA and a combination of two existing tools, jnet and STRAT, would proveis an ideal thus way of providing these two different types of views of a site either as a Harris matrix graph or as a 3D visualisation. Tools and techniques have been developed to interface the data structures of jnet and STRAT tools by graphically mapping their XML tags. One of theA strengths of this approach is that the integrated tools will use XML, a commonly available export format for databases. Moreover, it uses a commercially supported tool that allows users to graphically maps between two schemas, which meansso that anyone can configure the mapping. The **jnet graph tool** is written in Java and is the successor to gnet (an earlier version of the tool) and provides an interactive visualisation of a site according to thein the form of a Harris Matrix. Automatic diagram layout is provided, but users may edit any aspect of the diagram's appearance. A 2.5D view is also provided in which each layer or feature is represented by its plan shape and located in its correct horizontal position. Layers and features may be grouped together to show structures or phases, and multiple versions of a diagram may be created to show alternative interpretations. Jnet offers similar functionality to gnet, but with significant improvements



The jnet graph in SVG form as it appears in a web browser

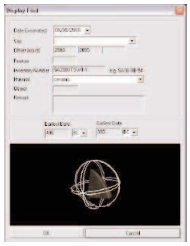
concerning interoperability with other programs, database connectivity and flexible access at any time. Unlike its predecessor, jnet workscan also be used on many different platforms andincluding mobile devices as well as throughand a web interface browser. It may be used on a single machine, or collaboratively in a networked environment. Jnet is based on a Model-view-controllercan be integrated with existing excavation databases to retrieve information about layers and features shown in the diagram. The graph model component stores a representation of the graph for manipulation and editing. The controller links the model with the view (represented by painter and canvas objects) and routes messages between them. The canvas interface may be plugged in to render the graphs in various formats either as part of a fully interactive display or a stream of graphical commands.

The **Stratigraphic Visualisation tool** (STRAT tool) provides a 3D visualisation of an excavation site. The tool enables wide-ranging visualisation and manipulation plus the storage and querying of archaeological data

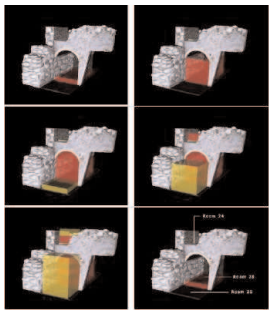


Strat tool: the user interface

such as building elements, artefacts, stratigraphy, plan and profile drawings and photographs. This data can be entered and visualised on in the STRAT tool. The digital nature of the software allows for complex querying, viewing, correlation and hypothesis testing to be carried out. A site can be viewed from any angle and position, as close up or far away as required. A 3D model of all aspects of the dig can also be represented including: scanned buildings and building elements; artefacts; stratigraphy; hypothesised/reconstructed building elements and surveyed points. In addition a variety of 2D information, such as: plan/profile drawings or Polaroid photographs that are often recorded about a site can also be entered into the STRAT tool's local database and visualised with the system.

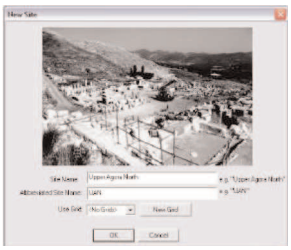


Displaying the attributes of an artefact including a 3D model

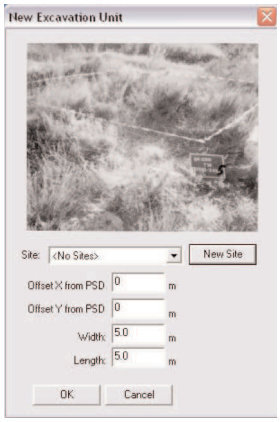


Replaying the excavation in reverse illustrating the strata being replaced

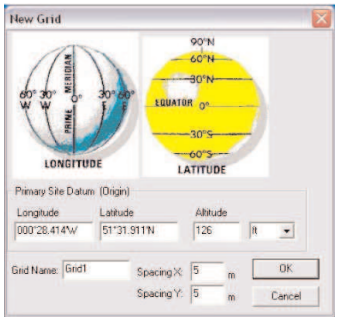
Integration A technique has been developed to map data between the Strat tool and Jnet tools by graphically mapping the XML tags between their XML schemas and then generating transformation software between the two schemas. The transformation software is used to then convert XML representations of the STRAT database into XML representations of the Jnet database and vice versa. This requires that Jnet and STRAT tool tools includes software to import and export their databases as anin XML fileorm. For example, when XML data is output by jnet, this it is converted into an XML file format the STRAT tool can recognise using the transformation software and imported into the STRAT tool's local database to enabling enable a 3D visualisation. Similarly, information from the STRAT tool database can be exported as an XML file, transformed into an XML structure suitable for jnet, and viewed as a Harris Matrix format. This approach can also be used to map legacy debases databases with the databases those of either jnet or STRAT tool.



The dialog to enter a new site

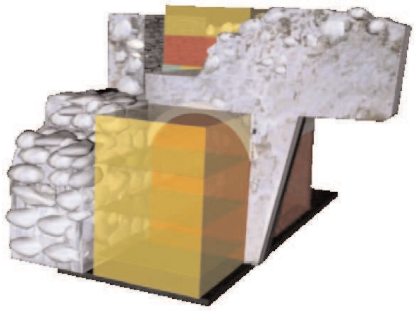


The dialog to enter a new excavation unit



The dialog to enter a new grid and its coordinates

Some dialogs (top, left) and outcomes (below) of the Strat tool.



Visualisation of stratigraphic layers

The **partners** of this showcase are:

- KU Leuven, Belgium
- Brunel University, UK
- University of Kent, UK

Interested?

Are you interested in this showcase? Do you think that this approach can help you in creating effective Cultural Heritage presentation projects or can be integrated in new research projects? Please contact Tijl Vereenooghe (tijl.vereenooghe@arts.kuleuven.ac.be) of KU Leuven at +32 16 325096.

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