

STARS – Semantic Tools for Screen Arts Research

S. Price, J. Tredgold, N. Rogers, M. Jones, D. Steer¹ and A. A. Piccini²

¹Institute for Learning & Research Technology and ²Department of Drama: Theatre, Film, Television
University of Bristol, Bristol, UK
simon.price@bristol.ac.uk

ABSTRACT

STARS is an open source e-research tool that enables screen arts researchers to browse, annotate and replay moving image content in order to better understand its thematic links to those people and communities involved in all aspects of its creation. The STARS software was built using Semantic Web technologies to address the technical challenges of integrated searching, browsing and visualisation across curated core data and user-contributed annotations.

Categories and Subject Descriptors

H.3.5 [Online Information Services]: Data sharing, Web-based services; H.5.1 [Multimedia Information Systems]: Hypertext navigation and maps; J.5 [ARTS AND HUMANITIES]: Performing arts (e.g., dance, music)

Keywords

e-research, heterogeneous data, annotation, visualisation

1. INTRODUCTION

The STARS software is the product of the Semantic Tools for Screen Arts (STARS) project, an 18-month collaboration between the authors and Bristol's Watershed Media Centre. A demonstration installation of the software, embedded into a WordPress-managed website, is publicly available¹.

The STARS project redeveloped and extended an existing Semantic Web tool, PARIP Explorer², and also migrated rich audio-visual screen arts databases, from the National Review of Live Art video collection³ and Watershed dShed⁴ archives, to the Semantic Web. The original PARIP Explorer tool was created by the Practice as Research in Performance (PARIP) project to allow researchers to browse and search connections between people and online practice-led research data [1]. STARS further leverages Semantic Web technologies to allow users to 'seamlessly' connect and extend data across its heterogeneous databases. This new tool enables screen arts researchers to browse, annotate and replay moving image content in order to better understand its thematic links to those people and communities involved in all aspects of its creation.

The initial entry point for STARS is a blog-style page of

articles presenting the user with brief summaries of available data sources, a search form, and links to introductory tutorials. By choosing one of the data sources or by entering a free-text search term, the user can begin to explore the data, in either case arriving at a search results page similar to Figure 1(a). Alternatively, instead of free-text, the QUESTION link allows constrained structured searches, such as "Find things created by" or "Find things located in", to be performed. These too arrive at the search results page. Clicking on any of the search result items displays a details panel with additional information about that item. Links within the details panel allow ad-hoc browsing of connected resources (i.e. people, places, events, etc.) as well as textual annotations of those resources made by users. Annotations of videos appear as clickable coloured lines and bars, grouped by user-defined themes, on a timeline below the video. Each search result item and each resource in the details panel also has a link labelled 'Map' which, when clicked, takes the user to a graphical representation of the data, similar to Figure 1(b). Connections may be explored interactively in the map view using the context menu and details panel.

Thus far, all this can be achieved without logging in. However, by logging into STARS using an OpenID account a number of additional features become available. The first, is a 'shopping basket' of resources, called the workbench, to which any resource in STARS can be added. Resources added from the map remember their position and so a map layout may be saved by simply adding it to the workbench. A user's workbench persists between sessions and may also be exported and shared with other users in the form of an RSS feed or as a PDF document. The second feature allows logged on users to document thematic links by adding free-text annotations to any resource, and by creating new connections between resources (seamlessly spanning databases). They may also tag resources using existing or new tags and, importantly in an open system, flag annotations as incorrect or offensive and in need of removal by an administrator.

2. ARCHITECTURE AND COMPONENTS

Throughout the STARS software, data is stored in RDF databases, using the Jena Java libraries. Data is stored about the core, administrator-provided, resource content, the annotations users make about these resources, and their workspace state. SPARQL templates are used to query this RDF data and the results populate both the HTML and the Ajax responses. The main vocabularies used are FOAF⁵ and

¹STARS demonstrator – <http://stars.blogs.ilrt.org>

²PARIP – <http://www.bris.ac.uk/parip>

³NRLA – <http://www.bristol.ac.uk/nrla/case-study/>

⁴dShed – <http://www.dshed.net>

⁵FOAF – <http://xmlns.com/foaf/spec/>

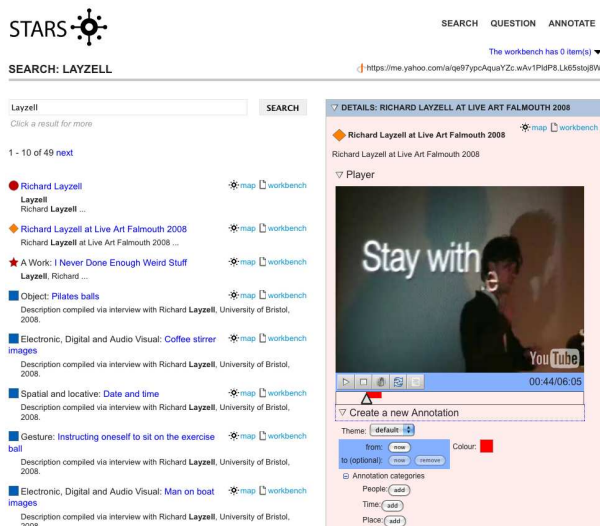
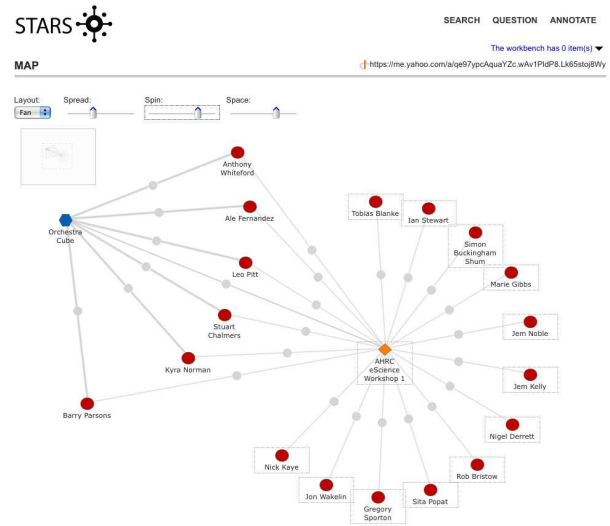


Figure 1: (a) Search results and video annotation.



(b) Map view of resources and connections.

RES, the Oxford MedSci researcher ontology⁶.

At its heart, the STARS software takes the form of a traditional Java web application (see Figure 2). Its servlet implementations provide HTTP access for a user's browser. This access can take the form of regular requests for HTML pages or, frequently, Ajax-style requests generated by Javascript in those HTML pages. The application's presentation layer is implemented using FreeMarker templates.

Google Web Toolkit (GWT) facilitated the development of browser-based Javascript using the software development tools of Java. GWT has been used extensively within this project with the aim of providing users with richly interactive tools within their browsers. The results can be seen in, for example, the workbench, the map and the video annotation tool. The last of these provides video timeline annotation capabilities over QuickTime and Flash videos (including YouTube). The video playback and annotation tool is a GWT widget that embeds the relevant third-party player for the data type in question. QuickTime and Flash are supported at present. For the annotation tool to function the player must issue events and accept input via Javascript. This allows the GWT widget to capture information about the current state of playback, and to issue commands to the player on behalf of the user.

The Caboto annotation project⁷ provides STARS with a component that allows users to make annotations about RDF resources. In STARS these annotations have taken the form of comments, tags, new connecting relationships and video timelines. Integration with STARS core RDF data allows STARS to visualise the resources, their relationships and the annotations users have made about them. The annotation and workbench functions require some form of user identification and to fulfil this requirement STARS uses OpenID. The authentication step protects both STARS and the Caboto web applications.

⁶RES – <http://www.medsci.ox.ac.uk/vocab/researcher/0.1>

⁷Caboto – <http://caboto.org>

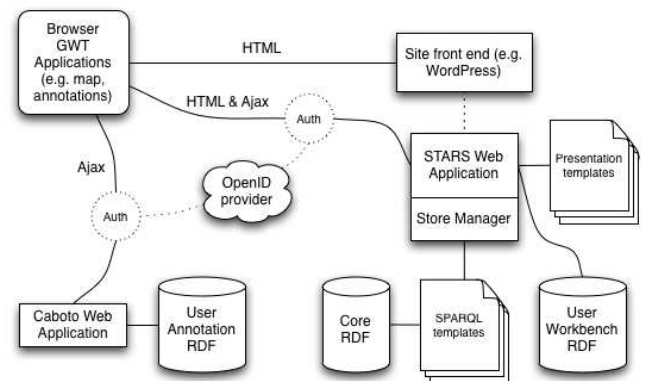


Figure 2: STARS system architecture.

3. DISCUSSION AND CONCLUSIONS

Feedback from user evaluation workshops has been highly positive, with themed video annotation, map browsing and the workbench being reported as particularly useful features. By far the most requested addition is for private annotations with an option to make them public. Currently, all annotations made by STARS users are public but future work might support the full range of Caboto functionality for the creation of private and virtual organisation annotations.

STARS demonstrates the utility of Semantic Web technologies for integrated searching, browsing and visualisation in the domain of screen arts research. It also paves the way to more generalised systems that can search and play audio-visual, online content, contextualised for specific domains.

4. REFERENCES

- [1] S. Price, A. Piccini, S. Agarwal, B. Kershaw, B. Joyner, and L. Miller. Parip explorer - researching the researchers. In *International Semantic Web Conference (ISWC2004)*, Hiroshima, Japan, 2004.