ARTWORKING – A SOCIAL NETWORK OF ARTISTS AND ARTWORKS

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Abstract: Artists and artworks are connected in a certain way. Artists can be connected to other artists who have the same influence, are born in the same place, have died in the same place, have painted the same subject and many other such relations. Artworks can be connected too: artworks about the same subject, painted on the same year, painted in the same era or painted by the same artist. There are websites on the internet which show information of artists and their artworks, a few may show artists who have painted during the same era. But relating artists and artworks based on many other parameters and having this information built and made available at a single website has not been done before. In this paper we present an application which allows users to build such relationships dynamically while working on data collected from a couple of sources.

1. Introduction:

Art collectors and general art lovers are always in search of information pertaining to artists of their interest so that they could probably make good reliable purchases or sales on art. They might have queries about artworks to find influences of artists, artists related to an era of an artist of interest, artists born in the same year, have been born in the same place and
artworks from the same museum to name a few so that they can find what they exactly want and at the same time not get too much data which could be confusing and not useful. The art collector would of course like to see all this data at once, on the same screen and on the fly.

Artworking is an application which achieves all of what would be required to be viewed by an art collector. It has a store built with a huge base of art data. The data is available to the user and relations can be built on the fly on a single screen making it very convenient to use.

The sections to follow describe how the application can be used by the user and what happens behind the scene.

2. The Artworking Application:

Artworking is a web application [Fig. 1] which depicts an artist as a graph where the artist’s name is constructed as a central node with his/her attributes connected to the central node as nodes themselves. An artwork is depicted in a similar fashion as well. Relationships are built by initiating links from attributes of an artist or artwork to other artist and artwork entities.

When the application first starts up on the browser a search box is provided into which a user can enter the artist he/she wants to search for and use as the base upon which relationships could be built.

Fig 1 – Artworking Interface
The self portrait of an artist along with his/her attributes or the portrait of an artwork along with its attributes are shown for the current node in focus (artwork or artist) at the top of the screen. For each attribute clicked in order to initiate a relation, a dialog box is shown with relevant questions pertaining to the attribute so that it can be used to build a relation with another entity or a group of entities (artist or artwork), thus extending the current graph.

3. **System Backend:**
   The system mainly comprises of 2 components. [Fig. 2]

   **3.1. Linked data retrieval and storage**
   The first data source used was [http://www.the-athenaeum.org](http://www.the-athenaeum.org) [3]. The data from this site had been scrapped using a java based crawler, collected in xml format in two separate files – one for all artists and the other for all artworks. The data was then converted into RDF using KARMA[1]. The second source was dbpedia[4] in which additional data of artists in the RDF format was already made available.
   The data from the sources were linked using SILK[2]. The string comparison metric used during linkage was Levenshtein distance. The main challenge was dealing with Unicode UTF-8 characters which posed a problem during data cleaning as well as record linkage.

![Fig 2 System Block diagram](image-url)
Additional modules were written in java to take care of data cleaning. The linked integrated data is persisted in a RDF data store.

3.2. User interface and Query Processing
The UI was developed predominantly using AJAX to take care of the asynchronous nature of the UI and JQUERY along with YQL to build and submit user queries to the underlying data store

There were two main challenges we addressed during UI development.

- Identifying relationships between entities (Artists and Artworks) which were not implicitly described by the underlying Semantic data.
  
  The application maintains a pool of possible questions [dialogs] which could be posed to the end user based on the source attribute of the relation(s) intended to be built. The set of all questions are based on the property names of all the attributes of an artist or an artwork. Based on the property name of the source attribute, relevant questions are picked in order to build further possible relationships.
  
  The results thus comprise of relevant and concise relationships.

- Addressing possible User Interface issues related to large results obtained when building relationships while not compromising the usability of the solution.
  
  Results are restricted to a certain lower bound for each node of the displayed graph. If the number of nodes exceeds the amount, nodes are grouped and labeled alphabetically thus building a tree of nodes.
  
  This results in a less crowded and easy to manage user Interface.
4. Concluding Remarks:

In this paper, we introduced Artworking, a web-based interactive application to generate relationships between artworks and artists based on their attributes. Artworking is a convenient tool not only for educational purposes, but also for commercial purposes as well. For example, art students can easily find groups of artists or artworks to base their studies on and art collectors can find attractive artists or artworks they might have not previously know. Moreover, the User Interface is highly interactive encouraging the user to actively participate in its usage.

The solution is highly scalable and can thus support enhancements in the future. Artworks and artists are likely to be affected by historical events and trends from outside the art society. Exploring relevant history can be used as one of the facets to fully understand relationships between artworks and artists.

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References:

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