Modelling the Functionality of the Multimedia Digital Library for Fashion Objects

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Abstract. This paper describes a project of a multimedia digital library for fashion objects. The presented work aims to provide an environment for the National Art Academy students works, showing in front a professional and non-professional public the significant values of the fashion domain.

Keywords: Digital Library, Functional Specification, Fashion Domain

1 Introduction

The fashion domain has its place in the contemporary information space. It reflects the choice of the society for the clothes. Preserving and presenting this public heritage is not new task, but is a long-term commitment for designers and modelers. Moreover, during the process on fashion study of young people it is often discovered new lines, talented creators and innovative fashion tendencies.

This paper presents the first attempt in Bulgaria to be developed a digital content management system (e.g. multimedia digital library), keeping fashion objects, created by students of the National Art Academy (NAA). The target objects are characterized with a wide variety – from sketches, closed models, fashion shows, clothe details, accessories, etc.

Section 2 discusses the content descriptive schema, used for presenting the fashion objects knowledge. Section 3 includes the functional specification project of the created environment. Finally, the paper discusses the future work on the implementation of the described project.

2 Descriptive Scheme for the Fashion Objects

Multimedia digital library for fashion objects (MDLFO) is a project of an Internet-based content management environment - a place where fashion objects of different kinds and origins were documented, classified, and "exhibited" in order to be widely accessible to both designers and the wide audience. The library plans to provide services for registration, documentation, access and exploration of a practically unlim-

ited number of fashion objects and knowledge and the end users can use this rich knowledge base through its interactive preview, objects complex search, selection, and grouping.

Digital Library for Fashion Objects includes a wide variety of descriptive data, such as title, object type, author, date of creation, collection it belong to, object annotation, etc. For the description of this content a descriptive scheme for the fashion object is developed. In this model the fashion objects world is described by 4 "thematic entities" (also called levels of knowledge): "Identification" entity (that consists of general data identifying aspects of the fashion object), "Annotation" entity (that concerns the details for the used materials and techniques during its creation, object presentation), "Digitized model" entity (that includes files, presenting the object), and "Review" (the collection in which the object is included). Figure 1 depicts the entities and their relations.

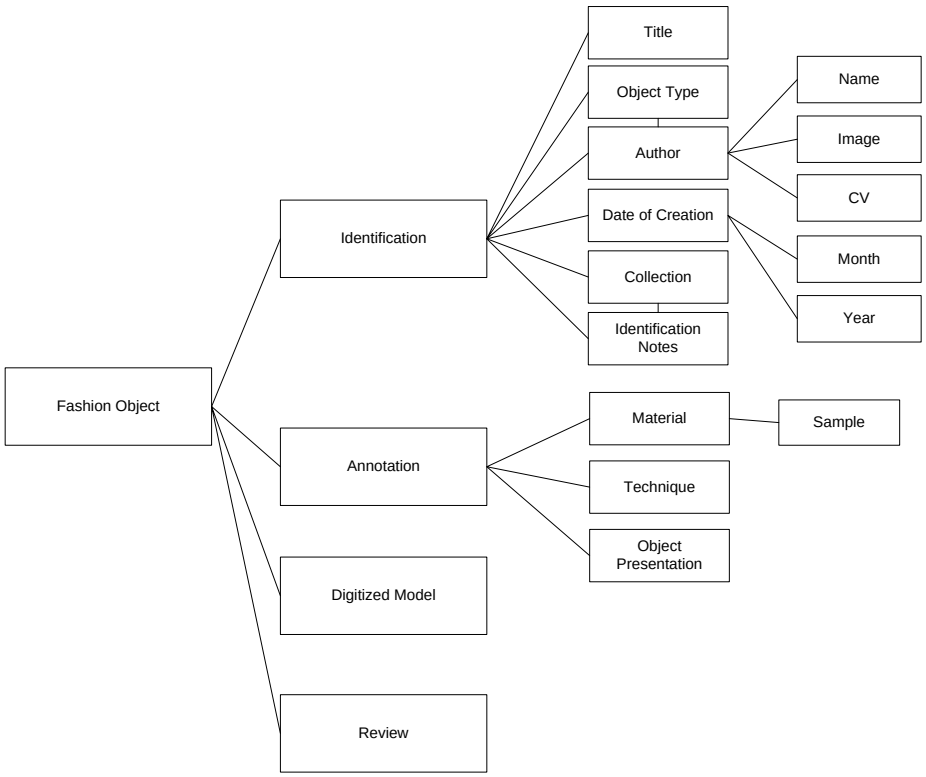

Fig. 1. Descriptive scheme for a fashion object

3 Functional Specification of a Multimedia Digital Library for Fashion Objects

3.1 Content Creation

The main part of the content creation process is the annotation and semantic indexing of digital objects in order to add them to the library repositories. The technical and semantic metadata entering in the MDLFO will be implemented through different automated annotation and indexing services.

An annotation template is developed for the description of fashion objects. The template will provide several options for easy and fast entering of metadata:

- Auto complete services (All used (already entered) field values are available in a special panel for reuse);
- Automated appearance of dependencies coming from the relations of the defined classes of fashion objects.
- Automated appearance of the number of the used field value, providing regular data tracking;
- A tree-based structure of the annotation template. Only checked fields are displayed for entering metadata;
- Possibility for adding more than one media for one metadata description in order to create rich multimedia digital objects;
- Reuse of an already created annotation for new fashion objects: the new media object has to replace the older one, the annotation is kept and the new fashion object appears after saving;
- Automated watermarking of the image and video objects;
- Automated resizing of the image and video objects;
- Automated identification of file formats;
- Automated conversion of the audio, video and text objects in a format suitable for Web-preview;
- Possibility for bilingual data entering with automated relation between the relevant values in different languages (optional);
- Image similarity recognition – In order to avoid duplicate image objects a service that checks the similarity between images is provided. It uses an algorithm that caching images for optimizing their compare (see [3]). Similar works for similarities calculation is proposed in [1].

As a part of the content creation panel will be included a terminology dictionary. After saving a new fashion object, a special machine traces for the appearance of dictionary terms in the object data. If some terms are available the machine adds links to their explanations. In the case of entering a new dictionary term, its presence in the available objects is discovered automatically and a link is added.

3.2 Content Presentation

During the development of the content presentation services a profound analysis was made of content selection and preview possibilities in order to satisfy the user's needs. First we had to determine the preview possibilities of a separate fashion object and its components and after that the preview of grouped objects.

The visualization of the rich semantic description of the separate fashion object is determined through hidden parts appearing in a new window after link selection. This possibility is used mainly for the long author's biography and for the dictionary terms. Parts of the descriptive data field are also hidden, but their values are available for searching in special forms.

The left frame of the preview window shows the description of the fashion object. In the right frame the media/s object/s is/are situated. There appears a link to the original media source. The shown media object is stamped through watermarking technique.

During the development of object grouping services the main fashion ontology classes are selected as object grouping criteria. For example, there can be a preview of the available fashion objects, grouped according to their title, author, fashion object type, collection or reviews. Using another grouping option the user can see separately a list of all designers (authors), and selecting one of them he can see additional biographic information and the collections of their work. A similar work is presented at [4] for the Iconographical domain.

Every user can create his private collection of selected objects after search activity. Rich search possibilities are available in order to assist collection creation. The user can write the collection's title and short description. He can also select its status: private or shared with other users. New objects for a collection appear automatically after their entering.

It is planned to be included personalized content preview as these presented at [2].

3.3 Content Search

Multimedia digital library for fashion objects will provide a wide range of search services, such as keyword search, extended keyword search, semantic-based search, complex search, and search with grouping results. Their realization was based on querying action to the MDLFO knowledge base using mainly the structural branches of the MDLFO content describing schema. Moreover, five types of conditions for the results set are meant:

- "objects having value $= v$ for characteristic c"
- "objects having value $\neq v$ for characteristic c"
- "objects having numeric value $\geq, \leq, <, >, or = v$ for a characteristic c". In the search templates you could search fashion objects with precise date or period. The period could have concrete beginning and end date with a year's. In the descriptive schema of MDLFO the relations of year's values are defined with rules.
- "objects having characteristic c"

– "objects NOT having characteristic c "

The search services support content request and delivery via index-based search and browse of managed content and its description.

3.4 Administrative Services

The Administrative services panel will mainly provide user data management, data export, tracking services, and analysis services. The user data management covers the activities related to registration, data changes, level set, and tracking activities of the user. The tracking services have two main branches: tracking of objects, tracking of user' activities.

The tracking of objects spies on the activities of add, edit, preview, search, delete, selection, export to XML, and group of MDLFO objects/collections in order to provide a wide range of statistic data (for frequency of service usage, failed requests, etc.) for internal usage and generation of inferences about the stable work (stability), the flexibility, and the reliability of the environment. The tracking of user' activities spies user logs, personal data changes, access level changes and user behaviour in the MDLFO.

The QlickTech® QlinView® Business Intelligence software is the analysis services provider. It is connected to the MDLFO tracking services and objects data base by preliminary created data warehouse.

The ETL (Extract, Transform, Load) is completely automatic process and is performed by administrator request.

The variety of generated statistic information about MDLFO data using QlickTech® QlinView® provides a rich extension of the tracking services and the base for profound analysis of extracted data.

The export data from the administrative services panel provides the transfer of information packages (for example, packages with MDLFO objects/collections, user profiles, etc.) compatible with other systems managing data bases. For example, with these services a package with library objects could be transported in a XML-based structure for a new external usage.

4 Conclusion and Future Works

Undoubtedly, the significant values of the fashion domain have to be made available in the global information medium. Its virtual presentation has to be executed through the best tools and techniques in other to continue to write traces in the history of the world arts. This paper presented a project of a Multimedia digital library for fashion objects and the developers' effort to build an applicable environment for fashion exhibitions.

The planned MDLFO functionality aims to serve fashion specialist and non-specialist. The group of specialists is composed by student-designers who study fashion professionally and search for specialized information on the observed objects. The

group of non-specialists has interests and wants only to learn more about the fashion domain. The release of MDLFO (under development) will support four users' levels: administrators, content editors, specialist viewers and non-specialists viewers with different privileges and access rights.

The future MDLFO extensions are related to the content enrichment and the inclusion of wide range of objects, created by NAA students.

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