

5SGraph Demo: A Graphical Modeling Tool for Digital Libraries

Qinwei Zhu, Marcos André Gonçalves, Edward A. Fox
Virginia Polytechnic and State University
Blacksburg, VA, 24061, USA
{qzhu, mgoncalv, fox}@vt.edu

Abstract

The current demand from non-experts who wish to build digital libraries is strong worldwide. However, since DLs are complex systems, it usually takes a huge amount of effort and time to create and tailor a digital library to satisfy specific needs and requirements of target communities/societies. What is desired is a simplified modeling process and rapid generation of digital libraries. To enable this, digital libraries should be modeled with descriptive domain-specific languages [1]. In a domain-specific modeling language, the models are made up of elements representing concepts, rules, and terminology that are part of the domain world, as opposed to the code world or generic modeling languages (e.g., UML [2]). A visual modeling tool would be helpful to non-experts so they may model a digital library without knowing the theoretical foundations and the syntactical details of the descriptive language.

In this demonstration, we present a domain-specific visual modeling tool, 5SGraph, aimed at modeling digital libraries. 5SGraph is based on a metamodel that describes DLs using the 5S theory [3]. The output from 5SGraph is a digital library model that is an instance of the metamodel, expressed in the 5S description language (SSL) [4].

5SGraph presents the metamodel in a structured toolbox, and provides a top-down visual building environment for designers (see Figure 1). The visual proximity of the metamodel and instance model facilitates requirements gathering and simplifies the modeling process. Furthermore, 5SGraph maintains semantic constraints specified by the 5S metamodel and enforces these constraints over the instance model to ensure semantic consistency and correctness. 5SGraph enables component reuse to reduce the time and efforts of designers. 5SGraph also is designed to be flexible and extensible, able to accommodate and integrate several other complementary tools (e.g., to model scenarios or complex digital objects), reflecting the interdisciplinary nature of digital libraries. The tool has been tested with real users and several modeling tasks in a usability experiment [5] and its usefulness and learnability have been demonstrated.

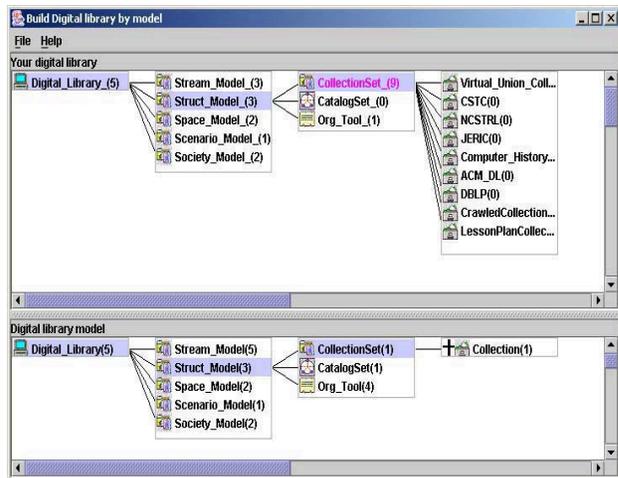


Figure 1. 5SGraph sample interface with structured toolbox (bottom part) and workspace (upper part); figure shows modeling of collections for the Computing and Information Technology Interactive Digital Educational Library (CITIDEL) project [6].

Acknowledgments

Thanks are given for the support of NSF through its grants: IIS-9986089, IIS-0002935, IIS-0080748, IIS-0086227, DUE-0121679, DUE0121741, and DUE-0136690. The second author also is supported by CAPES, process 1702-980.

References

- [1] R. B. Kieburtz et al., A Software Engineering Experiment in Software Component Generation, Proc. of 18th Int. Conf. on Software Engineering, Berlin, March, 1996.
- [2] G. Booch, J. Rumbaugh, and I. Jacobson. The Unified Modeling Language User Guide, Addison-Wesley, Reading, Massachusetts, USA, 1999.
- [3] M. A. Gonçalves, E. A. Fox, L. T. Watson, and N. Kipp, "Streams, Structures, Spaces, Scenarios, Societies (5S): A Formal Model for Digital Libraries," Virginia Tech, 2003. TR-03-04, <http://eprints.cs.vt.edu/archive/00000646/>.
- [4] M. A. Gonçalves, Edward A. Fox: SSL - a language for declarative specification and generation of digital libraries. JCDL 2002: 263-272, Portland, Oregon.
- [5] Zhu. Q. 5SGraph: A Visual Modeling Tool for Digital Libraries. Masters Thesis. Virginia Tech, 2002, <http://scholar.lib.vt.edu/theses/available/etd-11272002-210531/>.
- [6] CITIDEL. <http://www.citidel.org>