

Think Tank on Digital Library Interoperability

Contributed by:

Leonardo Candela and Donatella Castelli

Italian National Research Council

Pisa, Italy

{leonardo.candela, donatella.castelli}@isti.cnr.it

DL.org (www.dlorg.eu), a European Coordination Action on "Digital Library Interoperability, Best Practices and Modelling Foundations", has recently completed an important two-year research activity that investigated interoperability in Digital Libraries.

Interoperability is one of the challenges faced when building modern Information Systems and Digital Libraries that have to be built as "collections" of independently developed constituents (systems on their own) and that should cooperate and rely on each other to accomplish larger tasks. The DL.org project has addressed the interoperability challenge by bringing together over 50 international experts active in the Digital Library domain through thematic groups investigating the problem from diverse yet complementary perspectives.

This activity led to the creation of the "Digital Library Technology and Methodology Cookbook", an innovative artefact presenting a portfolio of best practices and pattern solutions to common issues faced when developing interoperable Digital Library systems.

Despite the critical role assigned to interoperability in modern systems, there has been little theoretical guidance on how to address it. What's more, there is no universally accepted definition of interoperability. A central part of the "Interoperability Cookbook" is a blueprint that can be used to systematically characterise diverse facets inextricably bound up with the interoperability challenge coupled with existing and emerging solutions underpinning practical approaches.

The proposed interoperability blueprint clarifies the constituents of any interoperability scenario, i.e., there are *at least two entities*, *Provider* and *Consumer*, that have to cooperate; the cooperation consists of a *Consumer* willing to exploit a certain *Resource* – owned by the *Provider* – to perform a certain *Task*. To make the scenario feasible the two entities should be able to *exchange "meaningful" information* that cannot occur without a *communication channel* and a *protocol* regulating the channel functioning. Finally, the operation of each entity, either *Provider* or *Consumer*, depends on *Organisational* (characteristics of business goals and processes), *Semantic* (characteristics of the meaning of the exchanged resource as well as of the rest of information) and *Technical* (characteristics of the technology supporting the operation of the entity as well as of the communication channel and the information exchanged) aspects that have to be reconciled across the respective boundaries. Thus, the framework enables the Digital Library field to move beyond some of the misconceptions about interoperability. In other words, interoperability is not merely a technical issue, nor is it just a content issue.

In the second part of the "Interoperability Cookbook", a set of approaches and solutions to interoperability problems related to content, user, functionality, policy, quality, architecture, and cross-domain aspects are collected and extensively discussed. The text is organised to provide the reader with useful information including: an overall description of each approach; a description of the requirements requested by the approach and the results resulting from its exploitation; and, most importantly, a description of implementation guidelines and an evaluation of the quality of the proposed approach that includes an estimation of its implementation cost and effectiveness. Overall, this document describes more than 50 interoperability solutions.

Interoperability is clearly a "*hot topic*", and new solutions and approaches continue to be designed and developed. Hence, at any point in time the Cookbook should be considered a dynamic artefact that is expected to expand and evolve thanks to the support of the Digital Library community at large.

In order to contact the keepers of this artefact and to contribute to it, please send an email to cookbook@dlorg.eu. The full document is available from <http://cookbook.dlorg.eu>.

The Digital Library Technology and Methodological Cookbook, April 2011, is co-authored by Athanasopoulos, G.; Candela, L.; Castelli, D.; El Raheb, K.; Innocenti, P.; Ioannidis, Y.; Katifori, A.; Nika, A.; Ross, S.; Tani, A.; Thanos, C.; Toli, E.; Vullo, G. and submitted to the European Commission as Deliverable D3.4.