8 Application of MTCC to the Digital Library Domain

This chapter describes the application of MTCC for system families from the Digital Libraries domain.

Section 8.1 introduces the system family of Digital Libraries that MTCC is applied to in this work. We examine a system family of three Digital Libraries, the scientific portal Sowiport, the interdisciplinary information Service infoconnex and the IREON portal of the German Institute for International and Security Affairs, addressing international relations and area studies. In addition to the Digital Libraries, we investigate the Apache search server Solr.

Section 8.2 discusses the test-relevant Services for this system domain. Beside the Test Steps that are specific to the requirements for a system family, MTCC also defines generic Test Steps, for instance for the comparison of variables that hold aspects of the state of a system family. These Test Steps are mostly independent from the systems, system family or application domain to which MTCC is applied. We examine these Test Steps in Section 8.3.

In Section 8.4, we discuss the system family-specific MTCC Services for the Digital Libraries considered in this work.

8.1 A System Family of Digital Libraries

The Digital Libraries Sowiport\(^1\) and infoconnex\(^2\) of GESIS as well as the IREON\(^3\) portal of the German Institute for International and Security Affairs form the system family [Par76] of testees to which MTCC is applied in this work.

MTCC regards the examined systems as Digital Libraries and therefore, as discussed in Chapter 4, as Information Retrieval systems. For the purpose of this work, we limit our analysis of Digital Libraries to the search process and the presentation of results. In addition to the digital libraries, MTCC is applied to the search server Solr\(^4\). We examine Solr in order to assess the applicability of MTCC

\(^{1}\)http://www.sowiport.de
\(^{2}\)http://www.infoconnex.de
\(^{3}\)http://www.ireon-portal.de
\(^{4}\)http://lucene.apache.org/solr/
to systems that are not members of the system family but rather part of their underlying infrastructure.

The three Digital Libraries considered have been designed and implemented at the German Social Science Infrastructure Services (GESIS) in cooperation with external partners. Figure 8.1 illustrates the relations of the systems as well as their commonalities.

The central use case that is relevant for all three Digital Libraries as well as Solr is search. A user formulates a query and submits it to the system, the system generates one or more lists of documents that are likely to be relevant to the query. The user surveys the documents in the result lists, selects documents according to her or his information need and further refines the query.

Sowiport, infoconnex and IREON differ in the functionality available for searching as well as in the types of interactions that are possible with an initial list of results. Solr does not support functionality for the refinement of queries.

All considered systems are web applications. A user interacts with such systems using a web browser and the HTTP protocol.

### 8.1.1 Sowiport

Sowiport is a disciplinary information portal for the social sciences. It integrates 15 databases and contains 2.5 million documents in total. The system is implemented in PHP and Java; a commercial IR system is used as its search back-end. Figure 8.2 and Figure 8.3 display the simple and the advanced search form of