

Zweitveröffentlichung des Aufsatzes /  
Replication of the article

**Historical and Media-Theoretical Implications  
of a Modern International Bibliography: Origin,  
Development and Future of the Index Theologicus  
in the Context of Other Specialised Bibliographies**

Autor/Author: Martin Faßnacht

Ersterscheinung in / first published at:

Theological libraries and library associations in Europe: a Festschrift on the occasion  
of the 50th anniversary of BETH. Brill, (Leiden), 2022, 382-428

Print-book ISBN: 978-90-04-52318-0

E-Book ISBN: 978-90-04-52319-7

DOI: 10.1163/9789004523197\_018

URL: [https://doi.org/10.1163/9789004523197\\_018](https://doi.org/10.1163/9789004523197_018)

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## Abstract

Specialised bibliographies – formerly in printed form, now online – have always been indispensable sources of information for academics. In 1975, the Index Theologicus (IxTheo) was founded in Tübingen under the name Zeitschrifteninhaltsdienst (ZID), in order to provide information on journal articles shortly after their publication to the academic community. This essay describes which informational needs the new service addressed and how it proved useful in the context of existing bibliographies. It depicts the development of IxTheo from an article database to an international bibliography produced cooperatively with modern features and a provider and advocate of open access. The media-theoretical implications of evolving publication paradigms are discussed. An emphasis is put on the further development of IxTheo from the point of view of the new paradigm of Open Science and the academic community's new needs.

## Résumé

Les bibliographies spécialisées – imprimées autrefois, présentement en ligne – ont toujours constitué des sources d'informations essentielles pour la science. En 1975, l'Index Theologicus a été fondé sous le nom de Zeitschrifteninhaltsdienst (ZID) afin d'informer la communauté scientifique sur les articles de revues peu après leur publication. Cet article détermine à quels besoins informationnels le nouveau service a répondu et comment il a fait ses preuves dans le contexte des bibliographies existantes. Il décrit le développement d'IxTheo d'une base de données d'articles à une bibliographie internationale produite en coopération avec des caractéristiques modernes, et un fournisseur et promoteur du libre accès. Il réfléchit aussi sur les implications, au niveau de la théorie des médias, de l'évolution des paradigmes de publication, mettant l'accent sur la poursuite du développement d'IxTheo par rapport au nouveau paradigme de la 'science ouverte' et aux nouveaux besoins de la communauté scientifique.

## Zusammenfassung

Fachbibliographien – früher gedruckt, heute online – sind seit jeher unverzichtbare Informationsquellen für die Wissenschaft. 1975 wird in Tübingen der Index Theologicus (IxTheo) als Zeitschrifteninhaltsdienst (ZID) gegründet, um Aufsätze kurz nach Erscheinen für die wissenschaftliche Fachcommunity nachzuweisen. Der Beitrag untersucht, auf welche Informationsbedarfe der neue Service reagierte und wie er sich im Kontext bestehender Bibliographien bewährt hat. Beschrieben wird die Entwicklung des IxTheo von einer Aufsatzdatenbank zu einer kooperativ erstellten, internationalen Bibliographie mit modernen Features und zu einem Anbieter und Förderer von Open Access. Reflektiert werden die medientheoretischen Implikationen sich verändernder Publikationsparadigma. Dabei wird ein Schwerpunkt darauf gelegt, die Weiterentwicklung des IxTheo unter dem Gesichtspunkt des neuen Paradigmas Open Science und neuer Bedarfe der Wissenschaft darzustellen.

# Historical and Media-Theoretical Implications of a Modern International Bibliography: Origin, Development and Future of the *Index Theologicus* in the Context of Other Specialised Bibliographies

*Martin Fafsnacht*

The anniversaries come in quick succession: This year, we remember the founding of the association ‘Bibliothèques Européennes de Théologie’ (BETH) 50 years ago, and we are grateful to the founding mothers and fathers for their foresight as they came together at the European level and transcended the boundaries of their own national viewpoints and sensitivities.<sup>1</sup> Last year, the American Theological Library Association (ATLA) celebrated its 75th anniversary. We will mark 100 years *Elenchus Bibliographicus* (ETL.EB) in 2024, 50 years *Index Theologicus* (IxTheo) and 125 years of bibliography in the *Revue d'histoire ecclésiastique* (RHE.B) in 2025.<sup>2</sup> These anniversaries may concern first and foremost the individual organisations celebrating them, but we, whose professional task is to supply information and tools for theology and religious studies, also share common goals and challenges: Our age is shaped by globalisation, digitisation and emancipation from the paternalistic control of religion. Does this mean for us more risk, volatility and disruption, or on the contrary more innovation and new alternatives?<sup>3</sup>

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\* Translated by David Cloutier.

- 1 There were informal meetings since 1961. In 1972, BETH was officially founded with statutes which were documented by a notary (Geert Harmanny, email, October 4, 2021). On the history of national and European theological library associations see André J. Geuns and Barbara Wolf-Dahm, “Theological Libraries: An Overview on History and Present Activities of the International Council of Associations of Theological Libraries,” *International Journal of Special Libraries* 32, no. 3 (1998): 140–42, <https://beth.eu/wp-content/uploads/2012/11/98-3geunsdahm.pdf>.
- 2 The printed issues of the *Elenchus Bibliographicus* (ETL.EB) and of the bibliography of the *Revue d'histoire ecclésiastique* (ETL.EB) were published until 2013. In 2014, the online versions of both bibliographies were merged under the name *Index Religiosus*.
- 3 The board of the ATLA discussed these issues on the eve of its 75th anniversary. See Stephen Sweeney, “President’s Message,” *ATLA: Annual Report 2020*, Chicago (2020): 2, [https://drive.google.com/file/d/1nxHhO\\_Hb-ciWcm3nh3ynVTYdAESlXsA-/view?usp=sharing](https://drive.google.com/file/d/1nxHhO_Hb-ciWcm3nh3ynVTYdAESlXsA-/view?usp=sharing). The

The task of libraries was and remains to provide the academic community with extensive literature and information, even though their circumstances and needs kept changing and will keep on changing in the future. The academic community was also involved early on at some faculties which published bibliographies of international renown. In the mid-seventies of the 20th century, the 'Universitätsbibliothek Tübingen' (UB Tübingen), home for decades to a specialised collection ('Sondersammelgebiet' or SSG) in theology, reacted to the changing informational needs of its users by establishing a current contents service for theological articles. This essay sheds light on this service and its further development in the context of other international bibliographies and takes a look as well at possible future developments and needs.

## 1 New Bibliographies Founded in the 1970s/1980s

The *Index Theologicus* was founded in 1975 as a current contents service – at the time under the name *Zeitschrifteninhaltsdienst (ZID) Theologie* – at the UB Tübingen with the goal to provide relevant articles in a fast and efficient manner to the academic community.<sup>4</sup> Corresponding models for this service existed already in the United States for the natural sciences, and in Germany, the German Research Council ('Deutsche Forschungsgemeinschaft', DFG) sponsored a similar service in linguistics.<sup>5</sup> As Franz and Landwehrmeyer wrote, "this form of quick information also had to be produced in the field of theology for all interested researchers and libraries."<sup>6</sup> The service began by processing 350 important journals at the international level, distributed among twelve subject groups, which covered the whole field of theology and church history.<sup>7</sup>

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keywords "risk," "volatility," "disruption" etc., which were used by Sweeney in his address, were taken from an article from Robert S. Landrebe, "Navigating in Changing Winds: Adaptive Strategies for Seminaries," *In Trust*, January 1, 2020, <https://intrust.org/Magazine/Issues/New-Year-2020/Navigating-in-changing-winds>.

4 The Donner Institute for Research in Religious and Cultural History started a similar service to Tübingen's ZID in 1985 under the name *Contenta Religionum: Current Contents of Journals in Comparative Religion*.

5 Gunther Franz and Richard Landwehrmeyer, "Vorwort," *Zeitschrifteninhaltsdienst Theologie. ZID*, no. 1 (1975): 1, <http://nbn-resolving.de/urn:nbn:de:bsz:21-opus-9547> (document *zid7501.pdf*).

6 Franz and Landwehrmeyer, "Vorwort," 1. Our translation. Henceforth, English quotes from German sources are translations made by the author/translator.

7 Gunther Franz, "Liste der 1976 ausgewerteten Zeitschriften: alphabetisches Titelverzeichnis," *Zeitschrifteninhaltsdienst Theologie: Register 1975*, Tübingen (1975): 3–10, <http://nbn-resolving.de/urn:nbn:de:bsz:21-opus-9547> (document *zid75re.pdf*).

In other places in the 1980s, new bibliographies also emerged which were dedicated to specific disciplines and used the computer technologies available at the time. At the former 'Institut für Alttestamentliche Bibelwissenschaft' and the 'Institut für Neutestamentliche Bibelwissenschaft' of the theological faculty of Innsbruck (Austria), later merged into the 'Institut für Bibelwissenschaft und Historische Theologie', a bibliography of Biblical exegesis called the *Bibelwissenschaftliche Literaturdokumentation Innsbruck* (BILDI)<sup>8</sup> was started in 1980 and was followed in 1994 by the *Kanonistische Literaturdokumentation Innsbruck* (KALDI),<sup>9</sup> which specialises in Canon Law. These bibliographies included articles from journals, essay collections and festschriften, as well as monographs and (later) book reviews. Also in the field of Biblical studies, the 'Institut romand des sciences bibliques' in Lausanne (Switzerland) launched the *Bibliographie biblique informatisée de Lausanne* (Bibil) in 1986. In Münster (Germany), the 'Institut für Kirchenrecht' founded the *Datenbank Kanonisches Recht* (DaKaR) for Canon Law in 1985, which allows a "search on the sources of publications related to the field in literature, norms and case law."<sup>10</sup>

The emergence of many new bibliographies at that time was evidence that the traditional bibliographies and library catalogues available could not fulfil the needs of the academic community (anymore). The indexing of articles from journals and essay collections was especially felt to be insufficient, and this problem became more acute as the number of new journals rapidly rose after World War II.

The number of new publications doubled already in the 1920s. A second wave of new journals came after 1945, and this wave remained at a high level for four decades with almost a hundred new publications every decade. In

8 BILDI was founded in 1980 as a card catalogue by Josef Oesch (Old Testament), Friedrich Mohr (Old Testament) and Konrad Huber (New Testament). In 1984, the computing department of the University of Innsbruck provided a relational database, which was replaced in 1987 by the STAR database. Under the long-standing leadership of the chief editor of the *Elenchus of Biblica*, Robert Althann, SJ, there was a collaboration from the 1990s on with the Bible Institute in Rome, which mainly provided the metadata of book reviews to BILDI. I thank Prof. Dr. Josef Oesch and Dr. Mira Stare for their information on the first years of BILDI.

9 KALDI was founded in 1994 by Konrad Breitsching at the suggestion of Josef Oesch.

10 "Recherche zu Fundstellen fachbezogener Veröffentlichungen in Literatur, Normen und Rechtsprechung," "Datenbank Kanonisches Recht (DaKaR)," University of Münster, accessed November 7, 2021, <https://www.uni-muenster.de/FB2/ikr/datenbank/index.shtml>. Since 1990, DaKaR holds a complete collection of guidelines of court rulings regarding church affairs from ecclesiastical as well as state courts.

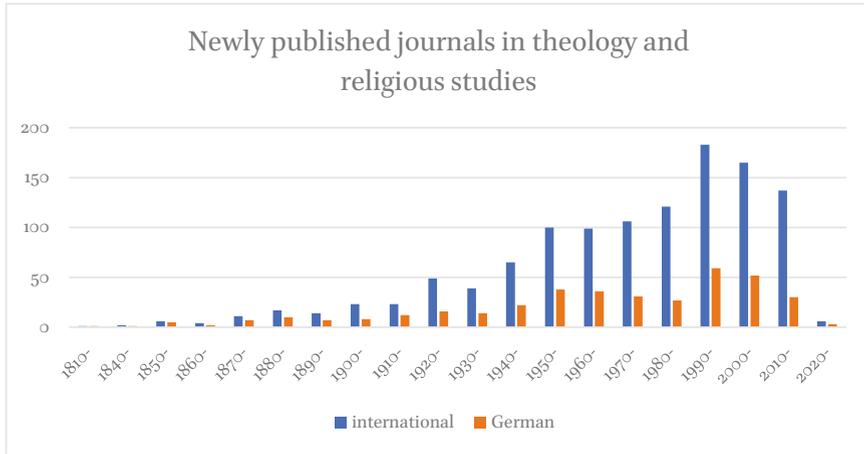


FIGURE 17.1 Diagram based on existing journals processed in IxTheo  
 This graphic displays only journals which have continuously been published since their foundation – including some whose name or concept has changed – but not journals which have ceased publication.

the 1990s, there was a remarkable third wave which has diminished since but remained high. Now, it is hard to predict how the number of new journals will evolve in the coming decades of the twenty-first century. I believe the trend towards new publications will continue because on the one hand, there is a growing willingness to start open access journals,<sup>11</sup> which do not require a publishing house or traditional publishing hierarchies, while on the other hand, established publishing houses are continuing their process of specialisation and focussing on more restricted and precise areas of research, which results in the creation of additional publications.<sup>12</sup>

11 Cf. “The Future of the Major Theological Bibliographies” [part 5 below, pp. 407–420].  
 12 See for instance the number of new journals created by Brill in recent years: 2011 (3), 2012 (5), 2014 (6), 2015 (1), 2016 (1), 2017 (1), 2018 (1), 2019 (4), 2020 (1). So in the past decade, Brill has started publishing no less than 23 new journals, and another 9 journals were added since 2016 in a new portfolio called *Brill Research Perspectives in...*, although these journals were transformed in series in 2021. One of the reasons for this transformation might be that libraries may now buy specific issues of these series. In Germany, just a few libraries, at times only the ‘Fachinformationsdienst (FID) Theologie’ at the UB Tübingen, had bought a subscription of these journals.

## 2 Libraries and Traditional Bibliographies

The task of putting together a research bibliography comes at the beginning of every academic project on a given subject. There are two types of search tools for this task: library catalogues and traditional bibliographies. Monographs could be found with the help of library card catalogues ordered alphabetically or according to their subjects,<sup>13</sup> but journal articles were usually systematically listed only in a bibliography. There would be an entry for a journal as a whole in the library catalogues, but not for a specific article or book review. The difference between catalogues and bibliographies is that the titles listed in a (card) catalogue correspond to actual books owned by the library, whereas a bibliography is put together independently of the library's actual collection. However, large libraries tasked with building up an extensive collection of literature in a given field, such as the UB Tübingen with its 'Sondersammelgebiet' (SSG) in theology and in religious studies, or the Maurits Sabbe Library in Leuven as well as the 'Bibliothèque nationale et universitaire' in Strasbourg, offered a comprehensive monographic bibliography in their library catalogues, whereas the editors of printed bibliographies depended on extensive local sources from which to draw their information.<sup>14</sup> This was especially true as getting hold of research literature from abroad was anything but trivial in the era before globalisation.

There were many reasons which prevented libraries from cataloguing literature such as journal articles and book reviews: On the one hand, it would have been an unmanageable task under the conditions of production and distribution of the analogue era with its card catalogues; on the other hand, it was not really necessary, since this task was fulfilled by the editors of relevant bibliographies. But even in the digital age, libraries have not been cataloguing articles in any significant way. The late Hermann Leskien, the former general director of the 'Bayerische Staatsbibliothek' (BSB), described in 1997 the libraries' handling of data on articles as unsatisfactory: "We have to agree with those

13 Umstätter and Wagner-Döbler differentiate between two basic types of subject catalogues: the systematic catalogue and the catalogue of subject headings. Cf. Karl Löffler, Walther Umstätter, and Roland Wagner-Döbler, *Einführung in die Katalogkunde: vom Zettelkatalog zur Suchmaschine*, 3rd ed. (Stuttgart: Hiersemann, 2005), 120.

14 Angelus Häußling, OSB refers to the importance of "large libraries" used by the editors of bibliographies in his historical overview on the journal *Jahrbuch für Liturgiewissenschaft*, when he notes that the editor Odo Casel had to produce the literature review in 1922 "without a large library, utterly without extensive academic tools." Angelus A. Häußling, "Das Jahrbuch für ‚Liturgiewissenschaft‘," in *Jahrbuch für Liturgiewissenschaft: Register zu allen von 1921 bis 1941 erschienenen 15 Bänden* (Münster: Aschendorff, 1982), 6.

who say that libraries are dealing with the most radical change at least since the emergence of journals in the 17th century. This brings up an unpleasant memory: A problem which came up at that time, namely the right way to deal with the indexing and dissemination of literature published in journals, has to this day not been solved in libraries in a satisfactory way.<sup>15</sup> Apart from a few exceptions, the cataloguing of articles was never established as a fundamental task for academic libraries. This problem is reflected in the fact that libraries have to pay significant amounts of money to buy additional metadata of inferior quality on articles from commercial suppliers in order to supply them in their own catalogues to their users.

Journals and yearbooks were a natural place for subject-related bibliographies, as well as important review journals such as the *Theologische Revue* and the *Theologisches Literaturblatt* (along with its predecessors) in the German-speaking world. Editors were academic experts in their own fields of interest, and because of their knowledge of the sources and subjects of research, they were well-equipped to sift through and comment on the literature being published. Parallel to the rise of academic literature, important traditional bibliographies emerged in the first quarter of the 20th century in certain areas of theology, often as an addendum to the academic articles of a given issue or volume. Journals such as the *Archiv für Religionswissenschaft* (1898), the *Revue d'histoire ecclésiastique* (1900), the *Elenchus bibliographicus biblicus* (1920), the *Jahrbuch für Liturgiewissenschaft* (1921),<sup>16</sup> the *Elenchus bibliographicus* in the journal *Ephemerides Theologicae Lovanienses: Commentarii de re theologica et canonica* (1924) were a few of the most important examples of subject-related specialised bibliographies appearing in print, and there were many more examples.<sup>17</sup>

15 Hermann Leskien, "Ein Zeitalter für Bibliotheken," *Zeitschrift für Bibliothekswesen und Bibliographie* 44, no. 1 (1997): 1.

16 Appeared in 1914–1921, continued from 1950 on under the name *Archiv für Liturgiewissenschaft*.

17 The *Internationale Bibliographie der Bibliographien 1959–1988 (IBB)*, vol. 6, lists 3114 bibliographies for theology, religious studies and religions other than Christianity. The majority of them were personal bibliographies and smaller bibliographies for special subjects. Cf. Hartmut Walravens and Ursula Olejniczak, eds., *Internationale Bibliographie der Bibliographien 1959–1988 (IBB)*, vol. 6: *Philosophy, Psychology, Law and Administration, Religion/Theology* (Munich: KG Saur, Reprint 2018), 146–235, <http://dx.doi.org/10.1515/9783110976472>. Although the IBB constitutes a very important and well-researched source, it is not entirely complete. For instance, the above-mentioned current content service *Contenta Religionum* is missing.

### 2.1 *Rome: Elenchus bibliographicus biblicus (1920)*

Since journal issues were published on a regular basis, it made sense to use them to report on the newest literature in the field. When the recently founded 'Pontificium Institutum Biblicum' in Rome<sup>18</sup> started the journal *Biblica* in 1920, every issue which was published four times a year included a section called *Res bibliographicae*, which was divided into book reviews and the so-called *Elenchus bibliographicus*. From the fourth volume (1923) on, the *Elenchus* was paginated separately in each issue with an additional asterisk, but consecutively across all four issues, so that libraries could detach them and bind them together on their own. This created for the user a consistent bibliographical tool which provided fresh information on the newest titles every quarter and made it possible to gather later all the titles published in that year in a separate volume. From 1943 on, the bibliographical titles were numbered consecutively and a source index was added in order to make the references easier to find.<sup>19</sup> This bibliography was printed from 1949 on under the name *Elenchus bibliographicus biblicus* which has remained well-known to this day.<sup>20</sup> Its new editor, Peter Nober, SJ, separated the *Elenchus* from the journal *Biblia* in 1968, because in the meantime, part of the bibliography had started appearing in the journal *Verbum Domini* as a supplement:<sup>21</sup> the trend of an ever-increasing number of theological articles discussed above seemed to be especially strong in the exegetical disciplines. The numerical growth of research articles left the editor with no choice but to separate the bibliography from the main journal. The libraries were then spared the trouble of collecting and binding the partial bibliographies into a single volume, but the users lost their quick access to the newest information, since they did not get a fresh update every three months like before, but had to wait at least a whole year to get the complete bibliography.

18 The institute was founded in 1909 under Pope Pius X and was led by the Jesuits. Cf. Maurice Gilbert, *The Pontifical Biblical Institute: A Century of History (1909–2009)* (Rome: Editrice Pontificio Istituto Biblico, 2009), 5.

19 This is not a systematic index of all the analysed sources, but only of the sources referred to with an abbreviation. Sources which do not require an abbreviation because their names are clear or short are not listed.

20 The name *Elenchus Bibliographicus* alone could have sown confusion, because the journal *Ephemerides Theologicae Lovanienses* also had an *Elenchus Bibliographicus*. From 1985 on, the bibliography was published under the name *Elenchus of Biblica*.

21 Cf. "Elenchus bibliographicus biblicus: Elenchus suppletorius, Roma 41.1960–47.1966," ZDB, accessed November 7, 2021, <https://zdb-katalog.de/title.xhtml?idn=01183322X>.

## 2.2 *Leuven: Revue d'histoire ecclésiastique (1900) and Elenchus bibliographicus (1924)*

Two important bibliographies, which covered together almost the whole field of theology,<sup>22</sup> were published in the form of journals at the Catholic University of Leuven/Louvain.<sup>23</sup> The *Bibliographie* of the *Revue d'histoire ecclésiastique*, which was published by historians from the University, provided information on the whole spectrum of Church History, while the *Elenchus bibliographicus*, which was published by professors from the faculty of theology, focused on dogmatics (*Theologia Dogmatica*),<sup>24</sup> moral theology<sup>25</sup> (*Theologia Moralis*) and canon law (*Ius Canonicum*).<sup>26</sup> Both bibliographies were initially published four times a year as a part of the current issue of their corresponding journals. Even though both bibliographies – in contrast with the *Elenchus bibliographicus biblicus* – always remained part of the printed issues of the journal, they were later bundled up in certain fascicules, thus becoming an independent entity with its own pagination which could be bound together in libraries and shelved separately. In the *Ephemerides Theologicae Lovanienses*, the second and third fascicules of the volume were exclusively assigned to the *Elenchus bibliographicus* for the first time in 1966. It became an impressive volume with 463 pages. The bibliography was later published as a double fascicule (2nd + 3rd) in one booklet. There were probably two main reasons for this. On the one hand, in order to produce a systematic classification of the titles according to their subject matter in the printed bibliography, it seemed more practical to compile all the newly published literature of a given year in *one* booklet rather than spreading the titles across several issues. This system was especially user-friendly for retrospective searches, because one only needed to look through

22 Biblical studies were missing in the beginning, but they were integrated later in the *Elenchus bibliographicus* (ETL.EB).

23 At the time when both journals were founded, there was one united university in Leuven/Louvain. In 1969, it was divided into two separate universities: the 'Katholieke Universiteit Leuven' (where the language used is Dutch) and the 'Université catholique de Louvain' (where French is used), which moved to Louvain-la-Neuve. However, professors from both universities are present in the redactional committees of both journals. (This information was provided by Leo Kenis.)

24 Dogmatics as a category also included the history of religions and the philosophy of religions. Cf. "Elenchus Bibliographicus," *Ephemerides Theologicae Lovanienses* 1 (1924): 108, 112.

25 Under the category of moral theology, fields such as fundamental theology, theology of the sacraments, pastoral theology, asceticism and mysticism were also covered. Cf. "Elenchus Bibliographicus," 106.

26 The thematic structure of the bibliography is explained in the first issue. Cf. "Elenchus Bibliographicus," 106–7.

one single booklet for a given year. On the other hand, the excessive multiplication of journals in these areas of theology made it necessary to adopt longer production cycles.

The publication dates of the *Bibliographie* of the *Revue d'histoire ecclésiastique* (RHE.B) changed: the bibliography first appeared in every issue, then it was spread across two issues, and from 1961 on, it was regularly published in three fascicules. This meant that the RHE.B always had the most up-to-date information, but it also made retrospective searches more time-consuming, since one had to search through the listings of all issues of a given year.<sup>27</sup> In printed bibliographies, the advantages and disadvantages are closely interlinked, and this link could only be overcome in the digital era.

### 2.3 *Chicago: Index to Religious Periodical Literature – ATLA (1953)*

“The bibliographical method” of the bibliographies discussed so far “consists in observing the whole current international literature production which concerns a certain subject-related question and in selecting and indexing from [this literature production] the relevant publications.”<sup>28</sup> However, the American Theological Library Association (ATLA) followed a wholly different approach with the publication in 1953 of the first volume of its *Index to Religious Periodical Literature*. The issues of 31 journals published from 1949 to 1952 were analysed with the help of 22 theological seminaries.<sup>29</sup> The goal was “to increase the subject and author indexing of religious periodical literature”<sup>30</sup> according to the first editor of the *Index*, J. Stillson Judah of the Pacific School of Religion. The index-based form of the bibliography defined beforehand a canon of journals to process, whose articles were then completely indexed.

The development of the *Index* in the course of time to become one of the most important bibliographic tools could not be foreseen in the beginning.<sup>31</sup> There were not only considerable “problems of organization and rules and their interpretation,” but the *Index* was also initially conceived only as a complement to other indices: only “thirty-one periodicals which are indexed in

27 “The frequency of publishing [which guaranteed that the RHE.B would be up-to-date] has quite a negative impact on retrospective searches.” Wolfgang Stoffels, “Untersuchungen zu wichtigen laufenden Bibliographien auf dem Gebiet der Theologie und Religionswissenschaft” (Cologne, 1976), 77.

28 Stoffels, “Untersuchungen,” 127.

29 J. Stillson Judah, “Preface,” *Index to Religious Periodical Literature* 1 (1953): v.

30 Judah, “Preface,” v.

31 At the UB Tübingen, the first volume was purchased in 1955 with funds from the German Research Council (DFG) within the framework of the ‘Sondersammelgebiet (SSG) Theologie’. At that time, a sticker was put on the inside cover with the following note: “Gift from the German Research Council 1955.”

neither the Reader's Guide to Periodical Literature nor in the International Index to Periodicals"<sup>32</sup> were included. While this principle was maintained in volume 2, the *Index* was expanded in scope in volume 3, and the number of journals was almost doubled: "While the Index is basically Protestant in outlook, selected Roman Catholic and Jewish journals are also included. The Index aims to be ecumenical on both the scholarly and popular levels. It is international in scope, including leading theological journals of Australia, Canada, England, France, Germany, Japan, and other countries. In short, the aim is to provide a general index to periodical resources in the areas of religious and theological scholarship."<sup>33</sup> The publication timeline of the *Index* reflects the extent of the challenges faced. The second volume was published in 1956, and then it was only starting at volume 4 (1960) that the *Index* could be published regularly on a biennial basis.<sup>34</sup> The *Index* was unique in its presentation: in the section called *Index to articles*,<sup>35</sup> a register in alphabetical order, subjects and authors were listed together. Some subject headings which covered a wider range of themes were subdivided further: for example, the subject heading *Missions* was divided in volume 3 into ten categories and dozens of geographical classifications.<sup>36</sup> As a result, titles were listed at least twice in the index: once under the name of the author, and once under one (or possibly even several) subject heading(s). The second section of the *Index*, called the *Index to book reviews*, consisted of an alphabetical list of authors of book reviews discussed in the journals collected in the *Index*. In this manner, the *Index to Religious Periodical Literature* always included a number of references to monographs as well.

#### 2.4 *Tübingen: Zeitschriften-Inhaltsdienst – ZID (1975)*

The growing mass of articles and book reviews from journals and essay collections as well as the quickly rising number of monographs often led traditional bibliographies to concentrate their work in one annual (double) issue. This alone stretched the amount of time between the appearance of a given publication and its referencing in the bibliography to up to 12 months. Delays in the delivery of publications, interruptions in their processing in the libraries and

32 Judah, "Preface," v.

33 Board of Directors, "Preface," *Index to Religious Periodical Literature*, 3 (1964): v.

34 Volume 3 constitutes an exception, as it included the years 1955–1956, but was published only in 1964.

35 This was the title used in volume 2 of the *Index to Religious Periodical Literature*.

36 *Biblical teaching, Conferences/Congresses/etc, Educational work, Ecumenical aspects, History, Methods, Native workers, Societies, Theory, Younger churches, Africa ... Japan ... Turkey.*

the sheer mass of articles to absorb led to ever-increasing delays. In a meticulous analysis, Wolfgang Stoffels calculated the average time delay for the eight most important current bibliographies and obtained the following results for the year 1969.<sup>37</sup>

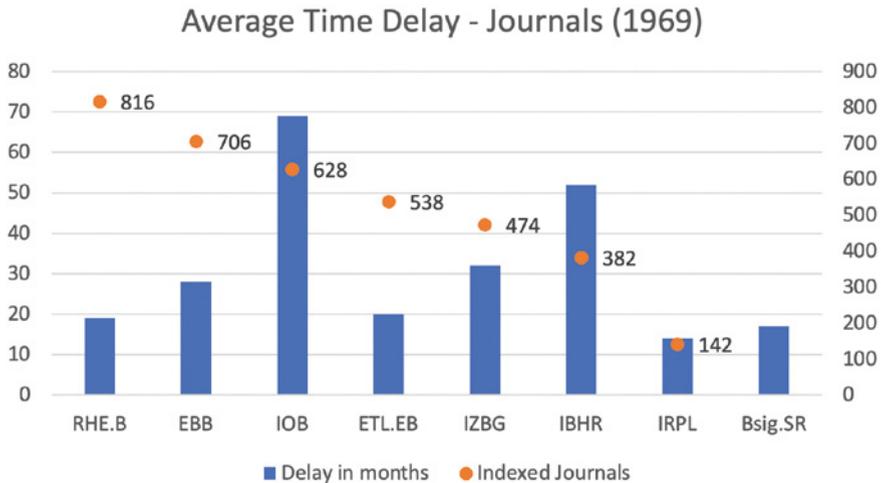


FIGURE 17.2 Average time delay – Journals (1969)

RHE.B	Revue d'histoire ecclésiastique. Bibliographie
EBB	Elenchus bibliographicus biblicus
IOB	Internationale ökumenische Bibliographie
ETL.EB	Ephemerides Theologicae Lovanienses. Elenchus bibliographicus
IZBG	Internationale Zeitschriftenschau für Bibelwissenschaften und Grenzgebiete
IBHR	International Bibliography of the history of religions
IRPL	Index to Religious Periodical Literature
BSIG.SR	Bulletin signalétique. Sciences religieuses

The number of journals included in each bibliography was integrated into the diagram in order to facilitate the assessment of the time delays.<sup>38</sup> Interestingly, bibliographies processing the highest number of journals did not necessarily incur the longest delays. The length of the delay had more to do with the type of bibliography: IZBG and IOB, which had especially long delays, were “reviewing” bibliographies, whereas bibliographies with shorter delays, such as

37 The statistics were taken from: Stoffels, “Untersuchungen,” “Anlage 7: Zahl der bearbeiteten Zeitschriften” and from the table “Mittlere Verzugszeit” (p. 145), and “Anlage 12: Mittlere Verzugszeit je Band/Heft einer Bibliographie” (both appendices [“Anlage”] without page numbers).

38 Stoffels was unable to assess the number of journals processed in Bsig.SR.

RHE.B, ETL.EB and IRPL, belonged rather to the category of “notifying” bibliographies.<sup>39</sup> Furthermore, factors such as local conditions, technical equipment, sufficient personnel and general organisational processes must have played an important role. Time delays of two years and beyond eventually crept into even the most productive notifying bibliographies. We should remember that these are only averages. Even in the case of RHE.B, which – compared to the high number of processed journals – shows an impressively low average time delay, just 62% of the titles from 1969 are referenced after 22 months, 82% after 29 months, 90% after 38 months, 96% after 51 months and 100% only after 79 months.<sup>40</sup>

Thus, a modern current contents service which would solve the problem of long time delays was needed, as well as a bibliographic enterprise which would cover the whole field of theology and religious studies.<sup>41</sup> At that time already, Wolfgang Stoffels came to the following conclusion: “At the present time, there is no comprehensive and current bibliography for all theological disciplines.”<sup>42</sup> Not only were the conditions for the foundation of the *Zeitschrifteninhaltsdienst Theologie* (ZID) in the middle of the 1970s extremely favourable, but there

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39 “Reviewing” (“referierende”) bibliographies provide descriptions or short abstracts, whereas “notifying” (“anzeigende”) bibliographies provide only the metadata of the titles. Stoffels, “Untersuchungen,” 140.

40 Stoffels, “Untersuchungen,” 68.

41 Shortly before the ZID was founded, the question of the proper form of cataloguing for articles was the object of a sharp debate among German libraries. This debate took place in the course of a project funded by the DFG in 1971 on the cataloguing of journal articles in the fields of English, German and Romance languages and literature; the question raised was which form of cataloguing would be the most efficient and user-friendly. In this project, articles from a selection of journals were registered on cards and integrated into the card catalogues of participating institutions. Criticism was voiced especially on two points: The selection of processed journals was incomplete, and the method of collecting and presenting the information with cards had a limited reusability. However, one of the main questions, namely the topicality of the cards with respect to the relevant bibliographies, was considered in a more differentiated way as the discussion went on. In the fields of German and French language and literature, the specialised bibliographies were published fairly quickly, while the time delay in the fields of English, Spanish and Italian was so long that it seemed a good idea to index the articles in a further card catalogue, a project which received financial support from the DFG. Thus, the supply situation in the different fields varied greatly, which meant that the time and resources required for such a task was justified only in special cases. Cf. Manfred Komorowski, “Die Diskussion um die Zeitschriftenaufsatzkatalogisierung Anglistik, Germanistik, Romanistik in den letzten Jahren,” *Zeitschrift für Bibliothekswesen und Bibliographie* 26, no. 2 (1979): 66–73.

42 Stoffels, “Untersuchungen,” 139. Stoffels saw a great deficiency especially in the field of practical theology.

was an additional fact which would give such an enterprise a better chance of success: the university library of Tübingen (UB Tübingen) was in charge of the specialised academic collection in theology ('Sondersammelgebiet [SSG] Theologie') within the framework of the program 'Sondersammelgebiete' of the German Research Council (DFG) for several decades. This unique system of specialised academic collections ensured that high performance libraries in Germany with specialised collections in certain fields and a strong relationship with the corresponding academic communities were tasked with obtaining academic literature which was published in foreign countries. At least one copy of every scientifically relevant book should be available in Germany.<sup>43</sup> Tübingen was the ideal location for the specialised collection in theology because of the presence of two theological faculties with a strong tradition in research and because of the fact that the UB "always grew in an organic fashion and never had to suffer any loss through war or fire in its 500-year history."<sup>44</sup> The fact that the specialised academic collection for the Ancient Near East ('SSG Alter Orient') was run as well at the UB Tübingen was also convenient. The titles gathered in this collection were essential for Biblical studies, especially for the field of Old Testament studies. A helpful further step was the transfer in 1981<sup>45</sup> of the specialised collection in general and comparative religious studies ('SSG Allgemeine und Vergleichende Religionswissenschaft') from the university library of Marburg to Tübingen. This meant that both closely related specialised collections, whose corresponding disciplines often overlapped with regards to the literature they required, were gathered in one single location. Tübingen was also well-equipped in its structure and personnel for such a new great adventure: the UB had a strong oriental department as well as a theological department with sufficient resources which was motivated and eager to discover something new.

The procedure to produce the *Zeitschrifteninhaltsdienst Theologie* (ZID) in printed form was simple and in keeping with the times: the tables of contents of the journals to process were first copied, an expert on the subject decided

43 On the "nationwide use as a basic purpose of the work of specialised collections" cf. Christian Herrmann, "Aktive Information als Aufgabe einer Sondersammelgebietsbibliothek am Beispiel des 'Zeitschrifteninhaltsdienstes Theologie,'" *Bibliothek* 26, no. 2 (2002): 176–178, <http://dx.doi.org/10.15496/publikation-34161>.

44 Hilger Weisweiler, "Möglichkeiten und Perspektiven der Kooperation auf dem Gebiet der theologischen Dokumentation" (Tübingen, 1995), 1 (unpublished strategy paper from April 10, 1995).

45 Gunther Franz, Dieter Ising, and Thomas Riplinger, *Theologische und religionswissenschaftliche Literaturinformation: Klassifikation zur Allgemeinen Religionswissenschaft und Systematischen Theologie als Arbeitsergebnis des Projektes THEODOK* (Frankfurt am Main: Werner Flach, 1987), 36.

which parts should be kept, and then the tables of contents were put together under a header which contained the information on the journal, its year of publication, volume and issue number. This master file was duplicated afterwards and sent to the subscribers.<sup>46</sup> In the first year (1975), six issues were published in this fashion, which each documented the tables of contents of the recently published issues of approx. 350 journals selected to be part of the bibliography's 'canon'. The tables of contents were grouped thematically in eleven sections and appeared within their section in alphabetical order,<sup>47</sup> followed by an index of authors. This allowed the user to find journals on his academic areas of interest more quickly rather than have to browse through the whole issue looking for them. From the third issue on, tables of contents from festschriften were also added after the tables of contents of journals. In parallel to the ZID, a service was set up which made photocopies of articles available through an interlibrary loan or through an ordering service with postcards.<sup>48</sup> This ZID-service required additional personnel and the development of ingenious business procedures.<sup>49</sup> But this all proved to be very useful for academics: they were supplied every second month with recently published titles from the most important journals in theology and religious studies. The need for this service and its popularity were reflected in a quickly growing number of subscriptions. In 1976, there were already 800 subscribers from Germany and other countries.<sup>50</sup> In the shortest time, the ZID surpassed the popular lists of new acquisitions published since 1973 by the UB.<sup>51</sup> In order to increase the usefulness of the bibliography, the last issue of every year was designed as a

46 On the details of the production procedure cf. Gunther Franz, "Der Zeitschrifteninhaltsdienst Theologie: Current-Awareness-Dienst und bibliographisches Hilfsmittel," *Zeitschrift für Bibliothekswesen und Bibliographie* 23, no. 6 (1976): 407–408.

47 The alphabetical principle was not kept when it was possible to save space by fitting in an extra table of contents on a half-empty page. This was a good method to avoid splitting a larger table of contents in two and spreading it on different pages.

48 The demand for this service was quite high. Cf. Michael Becht, "30 Jahre Dokumentation theologischer Aufsatzliteratur: Jubiläum in Tübingen," *Bibliotheksdiens* 39, no. 8–9 (2005): 117, 119, <http://dx.doi.org/10.15496/publikation-34145>.

49 "Various collaborators from different departments of the University Library, the Centre for Data Processing and the University Administration take an active part in the creation and dispatch of ZID," Gunther Franz, "Vorwort," *Zeitschrifteninhaltsdienst: Register 1976*, 8, (original English quotation from the bilingual preface), <https://publikationen.uni-tuebingen.de/xmlui/handle/10900/43824> (document zid76.re.pdf).

50 "Particularly in Austria, Switzerland and in the USA," Franz, "Vorwort," 7, (original English quotation from the bilingual preface).

51 The New Acquisition Lists Service ("Neuerwerbungslisten-Service") was followed by approx. 700 subscribers. Cf. Franz, "Zeitschrifteninhaltsdienst Theologie," 405.

register issue with an alphabetical and systematic index of titles and a cumulative index of authors. These indices were produced with the help of the computing centre of the university from the first issue on. The creators of the ZID were proud to announce: "The indexes will be fed on-line into a monitor, which is directly connected with the Centre for Data Processing at the University of Tübingen. The printing of the indexes is done by plotter; the reproduction of minuscule and majuscule letters is now possible through new software".<sup>52</sup> A new time was about to begin!

### 3 Digital Transition: From the *Zeitschrifteninhaltsdienst Theologie* to the *Index Theologicus*

Before the computer era, improvements in bibliographic tools were only possible in a very limited fashion: for years, progress meant steadily expanding the canon of processed journals as well as offering new indices and dividing the existing ones into more specific categories. In addition to the index of authors, the printed bibliographies gradually introduced separate indices for persons, subjects, places, Bible passages and terms in the original Biblical languages. In the case of the *Index to Religious Periodical Literature* (IRPL), the single index was divided into several indices which were published separately: Journal articles were now listed in *Religion Index One* (RIO), essays from essay collections in *Religion Index Two* (RIT) and book reviews in the *Index to Book Reviews in Religion* (IBRR). In the *Elenchus bibliographicus* (ETL.EB), sections entitled *Historia religionum* and *Scriptura sacra Veteris/Novi Testamenti* were introduced and widely extended in 1949.<sup>53</sup> The *Zeitschrifteninhaltsdienst Theologie* (ZID) added collections of essays, continuously raised the number of processed journals and introduced an index of Bible passages as a first indexing element related to subject contents.

A new era really began when both the production and the presentation of the issues could be accomplished on the computer. The American Theological Library Association (ATLA) was the first to offer its products online in the mid-1980s,<sup>54</sup> then distributed them soon after in the form of CD-ROMs, and now the *ATLA Religion Database* (RDB) has been published online on EBSCO for the

52 Franz, "Vorwort," 8 (original English quotation from the bilingual preface).

53 The section on Biblical studies grew in the 1970s/80s under the influence of chief editor Frans Neiryck to become the largest section in the ETL.EB (this information was provided by Leo Kenis).

54 Klaus Schreiber, "Religion index one," *Zeitschrift für Bibliothekswesen und Bibliographie* 32, no. 6 (1985): 521.

last 20 years.<sup>55</sup> The traditional printed bibliographies struggled more with this change. The *Internationale ökumenische Bibliographie* (IOB), the *Bulletin signalétique. Sciences religieuses* (Bsig.SR) and even the *Elenchus bibliographicus biblicus* (EBB) did not make it into the digital age; they all ceased publication.<sup>56</sup> The *Internationale Zeitschriftenschau für Bibelwissenschaften und Grenzgebiete* (IZBG) continued as an E-journal, but it was never integrated into a database and ceased publication in 2011. The *Elenchus bibliographicus* (ETL.EB) and the bibliography of the *Revue d'histoire ecclésiastique* (RHE.B) entered the digital age late, but then immediately in the form of online databases.<sup>57</sup>

In Germany, the Program of the Federal Government for the Support of Information and Documentation ('Programm der Bundesregierung zur Förderung der Information und Dokumentation' or 'IuD-Programm') was launched in the years 1974 to 1977.<sup>58</sup> Within this framework, an academic information system / academic information centre for the humanities (FIS/FIZ 14) was planned.<sup>59</sup> The FIS/FIZ 14 was to have six decentralised academic departments because of the large number of disciplines assigned to it. Department I (philosophy and theology) "was originally intended to be located

55 Ana Chackley, "Celebrating Atla: 75 Years of Scholarship," reprint (October 18, 2021) of an interview from June 14, 2021 under the title "Celebrating Our Products – 75 Years of Scholarship," accessed November 8, 2021, <https://www.ebsco.com/blogs/ebscopost/celebrating-atla-75-years-scholarship>.

56 The IOB ceased to publish in 1992, Bsig.SR in 1994, IZBG and EBB in 2011. The EBB's reviews have also been continuously included in the BILDI database and are now listed in the *Index Biblicus* and the *Index Theologicus* through the cooperation between BILDI (Innsbruck) and IxTheo (Tübingen).

57 The ETL.EB was published by Peeters from 2005 to 2013 as an online database. In 2003/2004, there was a CD-ROM version. This information was provided by Gilbert Van Belle and conveyed by Leo Kenis per e-mail on November 9, 2021. Cf. ZDB entry "ETL.EB," ZDB, accessed November 8, 2021, <https://zdb-katalog.de/title.xhtml?idn=976795817&view=full>. The bibliography of the RHE was additionally published by Brepols from 2009 to 2013 as an online database. Subscribers of the printed RHE.B could use the cumulative database, which contained the bibliography of the RHE.B from 1973 on. Information from Dries Vansacker conveyed by Leo Kenis per e-mail on October 25, 2021. Cf. also F. Keygnaert, E. Louchez, D. Vansacker, "Bibliographie de la RHE: Introduction," accessed November 7, 2021, <https://www.rhe.eu.com/fr/la-revue/la-bibliographie.html>.

58 For a detailed account of the IuD-program and its failure, cf. Petra Werner, "Dokumentation und Geisteswissenschaften: Zu Geschichte und aktuellen Problemen der Zeitschrifteninhaltserschließung – dargestellt anhand des Philosophischen Informationssystems (PHILIS) und des Zeitschrifteninhaltsdienstes Theologie (ZID)" (Cologne: Hochschulschrift, 1998), 26–66. <https://doi.org/10.15496/publikation-64378>.

59 For an overview of the 20 academic information centres planned and approved in 1979, cf. H.R. Simon, "Fachinformationszentren," *Zeitschrift für Bibliothekswesen und Bibliographie* 26, no. 6 (1979): 507–514.

at the 'Philosophisches Institut' of the University of Düsseldorf," but the decision was made in 1979 "that THEODOK should become the department managing the academic information fields of theology and religious studies at the UB Tübingen."<sup>60</sup> The project of a theological information and documentation centre ('Theologische Informations- und Dokumentationsstelle', or THEODOK) was funded starting in June 1979 as a preliminary project for the FIS/FIZ 14. Its goal was to produce, with the help of the electronic data processing capabilities available at the time, a comprehensive classification and subject heading list for theology and religious studies as groundwork for an international and ecumenical theological bibliography. The plan was to integrate both the *Internationale Ökumenische Bibliographie* (IOB), which had resettled "in 1978 its editorial office from Geneva (at the library of the World Council of Churches) to the UB Tübingen," and the *Internationale Zeitschriftenschau für Bibelwissenschaft und Grenzgebiete* (IZBG), which "in 1981 was organisationally linked with the UB Tübingen," in the THEODOK project.<sup>61</sup> Even though the need for this ambitious enterprise was great,<sup>62</sup> the project came to a sudden end on December 31, 1980. Apart from an oversized planning, this was due mainly to the federal structure of the German Federal Republic: Since the states, which were (and still are to this day) constitutionally responsible for cultural matters, could not guarantee their financial commitments, the German ministry of research and technology ('Bundesministerium für Forschung und Technologie', or BMFT) cut back its subsidy and cancelled its funding altogether on December 31, 1980. Negotiations between the university of Tübingen and the ministry of science and art in Baden-Württemberg in order to secure further financing for THEODOK failed as well; since the DFG was unable to take on the financing, it withdrew its financial support for the IOB. Only the "information services of the theological department which were funded with the help of the DFG and its own revenue," including the *Zeitschrifteninhaltsdienst Theologie* (ZID), could be continued.<sup>63</sup> A few tasks for THEODOK could be completed and even published later.<sup>64</sup> But they had no influence on future

60 Franz, Ising, Riplinger, *Theologische und religionswissenschaftliche Literaturinformation*, 23.

61 Franz, Ising, Riplinger, *Theologische und religionswissenschaftliche Literaturinformation*, 17.

62 This need was assessed in an opinion poll of 100 German professors in 1978. Cf. Franz, Ising, Riplinger, *Theologische und religionswissenschaftliche Literaturinformation*, 20–21.

63 Franz, Ising, Riplinger, *Theologische und religionswissenschaftliche Literaturinformation*, 24.

64 The classification was completed by Thomas Riplinger and published in Franz, Ising, Riplinger, *Theologische und religionswissenschaftliche Literaturinformation*, 83–207. The THEODOK-Thesaurus was published in four volumes in Dieter Ising and Thomas Riplinger,

developments. Proposals to adopt a more cooperative structure in order to divide up the work and costs could not be realised even later.<sup>65</sup> A low point was reached.

As a result, the focus was put on the continuation of established services, and the technical development of the ZID was relegated to the background. In August 1986, the UB Tübingen started cataloguing with the help of electronic data processing in the database of the 'Library Association of South-Western Germany' (Südwestdeutscher Bibliotheksverbund or SWB), in which all monographs of the specialised academic collections were entered.<sup>66</sup> However, new methods had to be designed for the cataloguing of articles and the presentation of the ZID. The new head of the theological department at the UB Tübingen, Hilger Weisweiler,<sup>67</sup> came to the following conclusion: "Two decades after the foundation of the ZID, its basic conception had lost none of its importance and relevance, but the rapid development of data processing technology made the production procedure and the presentation of information on literature [in the ZID] look antiquated."<sup>68</sup> The technical renewal came with the *allegro-C* software developed since the 1980s by the university library in Braunschweig. Preparations for a new ZID database on the basis of *allegro-C* began in 1992, the database was parameterised in 1994 and a first version was made available to the public in 1995. The ZID database was then offered on two 3.5-inch floppy disks which could be installed on PCs with the DOS operating system for the price of 350 DM. At the same time, the canon of processed journals was revised and expanded from 420 to over 500 journals. The database

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*THEODOK-Thesaurus: Alphabetische Schlagwortliste* (Tübingen: Universitätsbibliothek Tübingen, 1984).

- 65 Cf. the ideas of Gunther Franz, "Eine Zukunft für die theologische Literaturdokumentation," in *Theologische und religionswissenschaftliche Literaturinformation*, ed. Franz, Ising, Riplinger, 26–32. At the time he discussed these ideas, however, Gunther Franz had already left the UB Tübingen. From 1982 on, he was leading director of the municipal library and archives of Trier. Cf. "Gunther Franz," Wikipedia, accessed November 8, 2021, [https://de.wikipedia.org/wiki/Gunther\\_Franz](https://de.wikipedia.org/wiki/Gunther_Franz).
- 66 Tübingen was one of the four 'pilot libraries' of the association. Cf. Friedrich Seck, "Vom Bandkatalog zum Südwestverbund: Formalerschließung in der Universitätsbibliothek Tübingen," in "*Fest-Platte*": *Beiträge aus der Universitätsbibliothek Tübingen für Berndt von Egidy anlässlich seines Ausscheidens aus dem aktiven Bibliotheksdienst im Juli 2003*, Tübingen (2003), 4, [https://vergil.uni-tuebingen.de/publikationen/10900\\_43804\\_festplatte/festplatte/rundgang/pdf/seck1.pdf](https://vergil.uni-tuebingen.de/publikationen/10900_43804_festplatte/festplatte/rundgang/pdf/seck1.pdf).
- 67 Dr. Hilger Weisweiler led the theological department from January 1, 1992 to October 10, 2010.
- 68 Hilger Weisweiler, "Der Zeitschrifteninhaltsdienst Theologie der Universitätsbibliothek Tübingen," *Bibliotheksdienst* 30, no. 2 (1996): 244, <http://dx.doi.org/10.15496/publikation-34164>.

contained a classification designed by Thomas Riplinger *et al.* “with 130 subject groups which was hierarchic, allowed the use of truncated search strings, was theoretically expandable and had subject indexing through its class descriptions.”<sup>69</sup> This classification allowed the “selection of documents on the basis of broader relationships of thematic, geographical and temporal nature” and constituted a unique selling point on the “market of available theological databases.”<sup>70</sup> The ZID continued to be offered in a print version, but thanks to *allegro-C*, the old production procedure could be dropped. All records were now entered in the database and then imported and processed in a program called TUSTEP,<sup>71</sup> which was developed in Tübingen, and which provided the means to have “an appealing layout, [the ability to] display subject headings in the document, but especially a continuous numbering of the documents displayed, which led to a precise access to the index.”<sup>72</sup> Another innovation was that Bible passages were now indexed at the level of verses instead of chapters. This may not seem much, but this feature laid the foundations for IxTheo’s present search system for Bible passages, which is based on a modern algorithm and is unique in the whole world. A few desiderata remained nonetheless: Because of staff limits, not all desirable journals could be included in the bibliography, nor was it possible to undertake a complete subject indexing of the contents.<sup>73</sup>

But in 1996, subject indexing based on the RSWK<sup>74</sup> was introduced thanks to the personal efforts of the staff, and in 1997, the German Bishops’ Conference started funding subject indexing and classification with an impressive annual grant, which has continued to this day. From 1997 on, the database was offered as “a CD-ROM on the MS-DOS operating system, and from July of 1999 on also in a Windows version”<sup>75</sup> and updated twice a year. In the meantime, the technical capabilities were so widespread and had attained such a level of development

69 Weisweiler, “Zeitschrifteninhaltsdienst,” 246.

70 Weisweiler, “Zeitschrifteninhaltsdienst,” 246.

71 TUSTEP = ‘Tübinger System von Textverarbeitungs-Programmen’ (System of text processing programs from Tübingen).

72 Weisweiler, “Zeitschrifteninhaltsdienst,” 246.

73 Weisweiler, “Zeitschrifteninhaltsdienst,” 249.

74 RSWK = ‘Regeln für den Schlagwortkatalog’ (Rules for the catalogue of subject headings). This is a set of rules for subject indexing which was introduced in 1986 and has become standard in German-speaking countries. “RSWK, Regeln für den Schlagwortkatalog,” accessed November 7, 2021, [https://wiki.fachbereich-aub.de/wiki/index.php/Regeln\\_%C3%BCr\\_den\\_Schlagwortkatalog](https://wiki.fachbereich-aub.de/wiki/index.php/Regeln_%C3%BCr_den_Schlagwortkatalog). [= Klaus Gantert and Rupert Hacker, *Bibliothekarisches Grundwissen*, 8. vollständig neu bearbeitete und erweiterte Auflage (Munich: Saur, 2008), 181].

75 Barbara Wolf-Dahm, “Zeitschrifteninhaltsdienst Theologie,” *Zeitschrift für Bibliotheks- und Bibliographie* 46, no. 3 (1999): 249, <http://dx.doi.org/10.15496/publikation-34168>.

that the printed version could cease to be published at the turn of the millennium. In the beginning, the database was sold by the UB Tübingen itself, but from 2002 to 2006, it was commercialised by the publishing house Mohr Siebeck.<sup>76</sup> For this reason, the name of the bibliography was changed from the *Zeitschrifteninhaltsdienst Theologie* to the *Index Theologicus*. However, the goal of a wider distribution through a cooperation with a well-known publishing house was not fulfilled. The commercialisation of the CD-ROM proved to be too much of a burden and was only possible at certain intervals of time. Both problems undermined the unique selling point of IxTheo, which was to always provide information on the most recently published journal articles. The cooperation with the publishing house was ended by mutual consent in order to publish the database exclusively online and open access from 2007 on.

#### 4 The New IxTheo: Cooperation and Open Access

With its release as an open-access database in 2007, IxTheo reached a new milestone in its history. IxTheo was now unique among theological bibliographies which also covered the whole spectrum of theology and religious studies, not because it was an online database, but because it could be accessed free of charge by everyone. This fundamental decision was well ahead of its time back then and constituted the basis for a strategic reorientation. In July of 2011, I took over the leadership of IxTheo and the department managing it and I developed seven guidelines for the reorientation of IxTheo:

1. An independent and modern Internet presence: IxTheo should not disappear through integration in a larger database of a library association, but rather become the central research location for the academic community.
2. Expansion to become a comprehensive bibliography in theology and religious studies: IxTheo should include not only articles from journals and essay collections, but also monographs and other sources such as book reviews, weblogs, databases etc.
3. Free access to research: All basic services remain freely accessible without any barriers, only personalised services require a registration.

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76 A good overview of the history of IxTheo, its profile at that time in terms of contents, its search and save capabilities and its use at the university library in Freiburg as well as a detailed tribute may be found in Michael Becht, "30 Jahre Dokumentation theologischer Aufsatzliteratur: Jubiläum in Tübingen," *Bibliotheksdienst* 39, no. 8–9 (2005): 116–132, <http://dx.doi.org/10.15496/publikation-34145>.

4. Further development from a research tool to a content provider: Bibliographical research is a basic requirement, but users will want to access full texts directly in the future.
5. Information on the availability of a title: Not all full texts are open access; some are only available in print or through an electronic license at a given location. IxTheo should display this information regarding the campus of the user.
6. Cooperation with capable partners from church and state libraries: IxTheo cannot do everything on its own. There are large and important collections in other libraries, and a cooperation would bring added value to the user community.
7. Cooperation with editors and publishing houses: Content providers should be asked for their contribution in order to have more metadata on offer and to be able to develop new services such as a full text search on the contents owned by publishers.<sup>77</sup>

This plan was presented and discussed in 2013 at the 'Katholischer Fakultätentag' (Sankt Augustin) and the 'Evangelischer Fakultätentag' (Heidelberg).<sup>78</sup> Part of the plan was to develop IxTheo further with feedback from the academic community. This is why the Catholic and Protestant faculties of theology of the university of Tübingen were asked to become co-publishers of IxTheo.

In order to realise the main objectives described above, it was necessary to reorganise the department, which had been working as librarians in a traditional way, to introduce new production methods, to develop collaborative capabilities at the technical and organisational levels and to come up with a new plan to deal with the metadata being produced. An effective collaboration with other libraries was only possible if the metadata were not stored anymore in the stand-alone *Allegro*-database, but rather in the larger database of a library association. As theological monographs purchased at the UB Tübingen had been catalogued in the database of the 'Südwestdeutscher Bibliotheksverbund' (SWB, the Library Association of South-west Germany) since 1986, the idea to migrate the metadata of articles to this database seemed to suggest itself. A special selection program made it possible to immediately reuse all theologically relevant titles which had been catalogued by other libraries in the common database. The data is now supplied on a daily basis by

77 Martin Faßnacht, "Zukunft des IxTheo: Leitlinien der Entwicklung," Tübingen 2012 (unpublished strategy paper from July 27, 2012).

78 Martin Faßnacht, "Neuausrichtung der Sondersammelgebiete in Deutschland," Tübingen 2013, <https://nbn-resolving.org/urn:nbn:de:bsz:21-opus-67200>.

the common database, it is processed<sup>79</sup> and loaded in a SOLR index and then used and displayed in a new discovery system<sup>80</sup> which is independent from the library association. When the website was released in July 2016, over 1 million titles were available right away, thus doubling the number of referenced titles in comparison with the old IxTheo (ZID). As a central hub, the new IxTheo now allows users to search for monographs, articles and databases in one search environment – before, the user had to search through three independent databases – as well as giving a direct access to full texts depending on copyright and licensing conditions.<sup>81</sup> These transformations, which were funded by the German Research Council (DFG) through the funding programme for ‘Fachinformationsdienste’ (FID, specialised information services)<sup>82</sup> and were evaluated and followed with great attention by the academic community, constituted the prerequisites for all further developments of IxTheo to this day: the implementation of modern search capabilities for Biblical passages, canons and paragraphs of the *Codex Iuris Canonici 1917/1983* (CIC) and the *Codex Canonum Ecclesiarum Orientalium* (CCEO), dates (in years) and periods of time; the development of a multilingual metadata and full-text search in nine different languages; additional online access to the scanned tables of contents and literature indices of monographs;<sup>83</sup> the introduction of person information pages which provide detailed information on a given author, his/her academic network/relationships as well as further biographical and bibliographic information; the inclusion of new sources such as lexicon entries, archive material, estates, databases, websites, research blogs and research data; systematic references to primary and secondary literature from the 16th to the

79 The metadata is processed in a pipeline with 39 successive phases of data manipulation. Cf. “Marc Pipeline,” GitHub, accessed November 8, 2021, [https://github.com/ubtue/ub\\_tools/wiki/Die-IxTheo-MARC-Pipeline](https://github.com/ubtue/ub_tools/wiki/Die-IxTheo-MARC-Pipeline).

80 IxTheo is now built on the VuFind discovery system. Our own developments are integrated into official releases. Cf. “Contributions to VuFind.org,” GitHub, accessed November 8, 2021, <https://github.com/ubtue/tuefind/wiki/Contributions-to-vufind-org>.

81 “Index Theologicus,” IxTheo, accessed November 7, 2021, <https://www.ixtheo.de/>.

82 On the transformation of the DFG ‘Sondersammelgebiet’ (SSG) funding programme to the ‘Fachinformationsdienst’ (FID) funding programme cf. Marianne Dörr, “Vom Sondersammelgebiet zum Fachinformationsdienst – ein Praxisbericht,” *Zeitschrift für Bibliothekswesen und Bibliographie* 61, no. 3 (2014): 130–137, <https://doi.org/10.3196/186429501461338>.

83 IxTheo offers an open access to over 150 000 *tables of contents* of monographs (as of October 2021). The open access to *literature indices* was introduced as a new service in 2021; it allows users to view the literature quoted in a monograph without having to borrow a copy of the actual book.

18th century;<sup>84</sup> the cooperation with/integration of specialised bibliographies in Biblical exegesis,<sup>85</sup> church history,<sup>86</sup> canon law,<sup>87</sup> and patristics<sup>88</sup> in IxTheo.

In addition to the integration of new sources and types of literature and media, the number of theologically relevant journals indexed in IxTheo rose in a continuous fashion from around 600 to well over a thousand.<sup>89</sup> New production procedures made this possible: The tables of contents of print journals are now transformed into structured metadata (Marc21) through a semi-automatic procedure implemented by *ImageWare*, a software company from Bonn, Germany.<sup>90</sup> The data from electronic journals are transferred in a structured form from the websites of the publishers to IxTheo through a semi-automatic procedure driven by a literature management program called *Zotero*.<sup>91</sup> This procedure was developed further in IxTheo by our own IxTheo developers team to a fully automatic one which takes over all the metadata of the articles and book reviews from the new issues published online on the publishers' websites.<sup>92</sup> As of October 2021, 761 journals are catalogued with one of the two Zotero routines which have become our main production procedures.

84 Theologically relevant titles from the digital *Verzeichnis der im deutschen Sprachbereich erschienenen Drucke von 1501–1800* (VD16, VD17, VD18), a list of printed works from the German-speaking world from 1501 to 1800, were integrated into IxTheo.

85 'Bibelwissenschaftliche Literaturdokumentation Innsbruck' (BILDI).

86 Protestant collections in church history from the (1) 'Franckeschen Stiftungen' in Halle, the (2) Johannes a Lasco library in Emden, the (3) 'Reformationsgeschichtliche Forschungsbibliothek' (Research library on the history of the Reformation) in Wittenberg and the (4) 'Forschungs- und Studienstätte für die Kulturgeschichte des Protestantismus in der Frühen Neuzeit' (Research and study centre on the cultural history of Protestantism in the early Modern age) in Gotha.

87 'Kanonistische Literaturdokumentation Innsbruck' (KALDI); 'Datenbank Kanonisches Recht' (DaKaR), Münster.

88 'Augustinus-Literaturdatenbank', 'Zentrum für Augustinusforschung', Würzburg.

89 Another 150 journals which were indexed in IxTheo ceased publication. Our goal is to index, whether in a complete or selective fashion, about 1,400 journals currently being published. On the tension between *completeness* and *relevance* cf. Christian Herrmann, "Aktive Information als Aufgabe einer Sondersammelgebietsbibliothek am Beispiel des 'Zeitschrifteninhaltsdienstes Theologie,'" *Bibliothek* 26, no. 2 (2002): 178–180, <http://dx.doi.org/10.15496/publikation-34161>.

90 Martin Faßnacht and Winfried Gebhard, "Index Theologicus – neue Produktionsverfahren bei der Bibliographieerstellung," *BIT online* 19, no. 6 (2016): 511–514, <https://www.b-i-t-online.de/heft/2016-06-nachrichtenbeitrag-fassnacht.pdf>.

91 Timotheus Chang-Whae Kim and Philipp Zumstein, "Semiautomatische Katalogisierung und Normdatenverknüpfung mit Zotero im Index Theologicus," *LIBREAS: Library Ideas* 29 (2016): 47–56. <https://www.doi.org/10.18452/9093>.

92 Before a journal is incorporated in our automatic procedure, we first check whether its metadata can be completely downloaded and assigned to the right categories. The translator must often be adjusted or even changed to a new one in order to have an access

Along with a consequent open access strategy and new production methods, it was important to build up our cooperation capabilities for the future of IxTheo in the 21st century. For this purpose, our own metadata first had to be brought together at a central location, the common database of the SWB, and the tools necessary for formal and subject indexing had to be made available to our cooperation partners. The most crucial point is the continuous exchange of metadata between different systems. Since metadata are seldom 'finished' at any given point in time, it is not enough to perform an initial trade between cooperation partners; there has to be a regular exchange of corrections and supplements, such as the later standardisation of an author's name or an additional classification or subject indexing. In collaboration with the diocesan and cathedral library of Cologne, an asymmetrical procedure was developed for this purpose: The journals indexed in Cologne for IxTheo are catalogued, corrected and indexed directly in the IxTheo cataloguing tool. In exchange, IxTheo sends on a monthly basis to the library in Cologne not just the articles indexed there, but also all articles indexed in IxTheo from every journal to which the library in Cologne subscribes, together with all the corresponding corrections and supplements. The metadata loaded in the online catalogue of the diocesan library are overwritten every month and therefore always up to date. The asymmetry in the procedure lies in the fact that only one common entry system is used, the metadata are sent only in one direction and the processes of formal and subject indexing are kept separate in time. Cooperation agreements in which the partners migrate and present their data in IxTheo – while keeping their independence as organisations and in terms of visibility – are much easier to manage. The most challenging task in such partnerships is the complete migration of metadata to IxTheo. Before the data can be merged, they must be "cleaned up" (e.g. various spelling mistakes and the divergent spelling of proper names have to be corrected) and standardised, the articles must be matched with the proper journals or essay collections and duplicates must be removed. The ensuing cooperation becomes much simpler, because there is no more need to import or export metadata between different systems, all entries, corrections and additions are performed in one system, technical tools are shared among partners and the formal and subject indexing can be performed separately. The latter aspect is especially important because the

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of sufficient quality to the metadata. On the variety of translators used cf. "Zotero-translators," GitHub, accessed November 8, 2021, <https://github.com/ubtue/zotero-translators>. Unfortunately, there is no general quality standard among publishing houses for the metadata themselves and their transfer, which is why some publishing houses cannot be involved in this procedure.

formal and subject indexing of a source does not necessarily lie in the hand of one of the partners, but can be distributed among partners instead in accordance with issues of practicability. For example, IxTheo uses automatic procedures to catalogue journals which are then indexed with subject headings by a cooperation partner. For the task of subject indexing, a tool called the *Digital Assistant* (DA-3),<sup>93</sup> which is used by several libraries, was developed further in collaboration with the software firm *Eurospider* to such an extent that article data can now be indexed efficiently with it. This web-based tool is available free of charge to cooperation partners.

The first partnership was struck and implemented with BILDI and KALDI (Innsbruck, Austria) after a meeting I had with Mira Stare, the manager of BILDI, at a conference in May of 2014 near Salzburg.<sup>94</sup> This was followed by cooperation agreements with DaKaR (a database of canon law based in Münster) and the 'Augustinusdatenbank' (database on Augustine) of the 'Zentrum für Augustinusforschung' (centre for research on Augustine, located in Würzburg). The migration of data from Mikado (a missiology database located in Aachen)<sup>95</sup> is also planned.

While preparing the migration of metadata from these cooperation partners into IxTheo, we expanded our concept of presentation, allowing for specific subsets of metadata to be presented on their own, while keeping all metadata referenced in the central IxTheo database. It seemed appropriate to provide a special, more focused access to academic subjects such as Biblical studies<sup>96</sup> as a major theological discipline, canon law<sup>97</sup> and Augustine (from a theological and historical point of view) for the benefit of the academic public interested in them. Since the corresponding subsystems contain only a subject-related subset of IxTheo, they list much fewer titles, which helps researchers save time and focus on their area of interest. In addition to this selection, further functions and facets may be used which are important for the discipline. Larger

93 Regine Beckmann and Imma Hinrichs, Melanie Janßen, Gérard Milmeister, Peter Schäuble, "Der Digitale Assistent DA-3: Eine Plattform für die Inhaltserschließung," *O-Bib* 6, no. 3 (2019): 1–20, <https://doi.org/10.5282/o-bib/2019H3S1-20>.

94 I would like to thank Ernst Ruschitzka for his role in helping the cooperation with BILDI become reality. He had invited representatives from BILDI, BiBIL and IxTheo at the conference of the 'VÖB-Kommission für Theologische Spezialbibliotheken' in Michaelbeuern (Austria) on the topic of theological literature databases.

95 'Missionsbibliothek und katholische Dokumentationsstelle des Missionswissenschaftlichen Institutes im missio e.V.' "Mikado Aachen," accessed November 7, 2021, <https://www.mikado-ac.info/>.

96 <https://bible.ixtheo.de>, accessed November 8, 2021.

97 <https://churchlaw.ixtheo.de>, accessed November 8, 2021.

datasets related to a given discipline can be presented in such subsystems in addition to the representation in IxTheo, whereas the effort and expense required to build up and maintain such a subsystem may prove to be too much for smaller datasets. Furthermore, there is also the aspect that too much differentiation in several subsystems could confuse the users. However, smaller, more specialised bibliographies can be described, highlighted and presented as collections in IxTheo. Such a project was realised for the first time with collections on Protestant church history from Gotha, Emden, Wittenberg and Halle. A collaboration with the Princeton Theological Seminary (PTS) was also built up this way, with the result that IxTheo now references PTS' open access and digitised catalogue of monographs and other sources.

The will to cooperate, the development of the ability to work with partners, the harmonisation of the processes and tools are all important steps for a successful and enduring cooperation. But this cooperation is founded on the partners' shared conviction and belief that the concept of open access is essential to make the scientific means of information of our time globally, identically and equally accessible to everyone.

## 5 The Future of the Major Theological Bibliographies

The future of academic theological bibliographies which are not limited to some special areas, but cover the whole spectrum of theology and religious studies, will probably depend on four factors:

1. The presentation and publication form may not contradict the scientifically dominant paradigm of our time.
2. The bibliographies – while maintaining a high quality level – must be comprehensive, have an international orientation and include all current and future media types and sources. At the same time, they must offer subject-related selections in order to help users manage the huge amount of information at their disposal.
3. The bibliographies must furthermore offer added value in terms of form and contents in comparison with major search engines while covering the (future) needs of academics.
4. The bibliographies must expand their range of services in such a way that innovative research approaches and new processing techniques can be applied on the material available.

In the following, a few aspects and concrete fields of action which result from the four factors described above are presented and discussed.

### 5.1 *The New Leading Paradigm: Open Science*

The change from a dominant paradigm to a new one is essentially characterised by intrinsic motivations. The associated implications give the new leading paradigm its own dynamic and inevitability. In the course of the history of media, such transitions happened time and again: As the production of books went from copying by hand to the printing press, the monastic and secular scriptoria<sup>98</sup> of the Middle Ages did not vanish right away, but the triumph of printing technology proved to be unstoppable. The advantages of a much faster production method of text as a medium, of an almost infinite reproduction and duplication of knowledge which facilitated its written reception and documentation, of literacy and of the democratisation of knowledge in a certain way were so clear that the paradigm shift inexorably took its course.<sup>99</sup> The paradigm shift from analogue to digital means of communication which is taking place in our time is just as unstoppable, even though it will probably not lead to the complete disappearance of printed books and journals. This is due to the pleasure of the haptic experience and the practicality of the touchable medium, but the jury is still out on this subject, because the advantages of digital media, such as their quick availability anywhere at any time as well as the unlimited accessibility of texts and of new technical possibilities are obvious. However, these promising capabilities have not been exhausted yet by any means, but are still subject to the limitations of the era of printed media. It is therefore not surprising that a new dominant paradigm aiming to overcome these limitations is working its way up among the scientific and academic community. The new paradigm shift establishing itself is the transition from *closed science* to *open science*. Matthias Schulze and Ralf Stockmann define “Openness and networking as main recurring themes ... of digital science in the 21st century.”<sup>100</sup> This topic is not new, but it has acquired a new urgency in the context of calls for *open access* and *open data*. Daryl E. Chubin already defined in 1985 (sic!) *closed science* “as research which, in its production,

98 “Skriptorium – Buchproduktion im Mittelalter,” accessed November 8, 2021, <https://digi.ub.uni-heidelberg.de/de/bpd/skriptorium.html>.

99 Cf. Andreas Degkwitz, “Open Science: Kooperation zwischen Bibliothek und Wissenschaft,” in *Kooperative Informationsinfrastrukturen als Chance und Herausforderung*, ed. Achim Bonte and Juliane Rehnolt (Berlin and Boston: De Gruyter Saur, 2018), 438, <https://doi.org/10.1515/9783110587524-044>.

100 Matthias Schulze and Ralf Stockmann, “Offenheit und Vernetzung als Leitmotive und Visionen einer digitalen Wissenschaft im 21. Jahrhundert,” in *Evolution der Informationsinfrastruktur: Kooperation zwischen Bibliothek und Wissenschaft*, ed. Heike Neuroth, Norbert Lossau, and Andrea Rapp (Glückstadt: Verlag Werner Hülsbusch, 2013), 31–38, <http://dx.doi.org/10.18419/opus-6439>.

communication, or utilization, is inaccessible to potential consumers.”<sup>101</sup> *Open science* is now defined by Christian Heise and Joshua Pearce as a “complete access to the entire scientific knowledge process (open science), which includes access to open data, open methodologies, as well as FOSS [Free and Open Source Software, M.F.] and libre hardware” in contrast to *open access* as a “pure access to published knowledge.”<sup>102</sup> However, the much broader concept of open science, which also implies societal, social, political/democratic and ethical challenges, must be divided up into concrete fields of action which can be operationally implemented and fulfilled. Andreas Degkwitz refers to the Open Science Monitor of the European Commission which identifies three fields of action with reference to central elements of research processes: “Open Research Data, Open Scholarly Communication, Open Access to Publications.”<sup>103</sup> An even more comprehensive approach including open source software, code, hardware, infrastructure as well as open educational resources, is proposed in the *Draft Recommendation on Open Science* of the UNESCO.<sup>104</sup>

In the concrete area of open access, in which libraries also have some leeway, since they can influence as intermediaries the acquisition policy of an institution, some clear tendencies are emerging as well, even though the details of transformation are often too complicated and their effects are unclear and (too) costly.<sup>105</sup> Neither society nor the academic community will accept permanently the fact that the results from research which was funded by the state

101 Daryl E. Chubin, “Open Science and Closed Science: Tradeoffs in Democracy,” *Science, Technology, & Human Values*, 10 (1985): 74, <https://doi.org/10.1177/016224398501000211>.

102 Christina Heise and Joshua M. Pearce, “From Open Access to Open Science: The Path From Scientific Reality to Open Scientific Communication,” *SAGE Open* 10, no. 3 (2020): 3, <https://doi.org/10.1177/2158244020915900>.

103 Degkwitz, “Open Science,” 440–41.

104 “Draft Recommendation on Open Science (Document code: 41 C/22),” (September 8, 2021: Annex page 4–6). UNESDOC Digital Library, accessed November 8, 2021, <https://unesdoc.unesco.org/ark:/48223/pf0000378841>.

105 An example of such a transformation is the case of the DEAL contracts concluded in Germany with the publishing houses Wiley and Springer Nature. Cf. “Projekt DEAL: Bundesweite Lizenzierung von Angeboten großer Wissenschaftsverlage,” accessed November 8, 2021, <https://www.projekt-deal.de/>. On the possible consequence that DEAL could push smaller publishers out of the market and lead to a market concentration cf. Justus Haucap, Nima Moshgbar, and Wolfgang Benedikt Schmal, *The Impact of the German “DEAL” on Competition in the Academic Publishing Market*, DICE Discussion Paper 360 (Düsseldorf: Heinrich Heine University, 2021), <http://hdl.handle.net/10419/231802>.

remain accessible only under *closed access* conditions. This trend is not just reinforced by research sponsors, but also comes – because of intrinsic motivations – from the academic community itself. The willingness – even in theology – to found new open access journals and to invest a lot of time, energy and commitment in them, as well as the many large and small retro-digitising projects worldwide are a clear indication of this. In recent years, seven new journals mostly with an international outlook were founded in our own *IxTheo Open Journal* platform alone.<sup>106</sup> Hundreds of new open access journals in theology, religious studies and religious philosophy are referenced in the *Directory of Open Access Journals* (DOAJ).<sup>107</sup> Bibliography providers must prepare early for this new paradigm which is becoming increasingly dominant. More and more content is being offered with *open access*. If the content is accessible free of charge, it seems all the more absurd when a bibliography as an information medium and a tool to find this content is not *open access* as well.

Open access does not imply that the production and current management of the means of information cost nothing. The preparation of a bibliography requires trained personnel (academic specialists, librarians, IT-experts, assistants) as well as basic technical equipment and an organisational structure. All this must be financed. The pillars of IxTheo's funding are: (1) Basic funding comes from the state of Baden-Württemberg as the funding body of the university library, (2) grants at the federal level come from the German Research Council (DFG) and (3) some funding is provided by the German Bishops' Conference, i.e. the Roman Catholic Church. This funding model allowed the UB Tübingen to carry out the transition of IxTheo to an open access product in 2007 without any complicated financial-organisational transformation. The innovations and international partnerships thus made possible were already described above. In contrast to this, the ATLA Religion Database (RDB) is financed through licensing fees. The main obstacle for a cooperation between IxTheo and ATLA RDB is not academic or scientific, but rather lies in the different financing models used and their corresponding presentation and operating modes which are *open access* in the one case, and *closed access* in the other. A close cooperation between IxTheo and ATLA RDB would require a transformation of the financing model of ATLA RDB. Would this be unthinkable? The transformation of the financing of journals from a subscription-based

106 "IxTheo Open Journals," IxTheo, accessed November 8, 2021, <https://www.ixtheo.de/OpenJournals>.

107 In the DOAJ, 17,111 open access journals (as of November 13, 2021) are referenced, 12,095 of which are without APCs. In *Philosophy, Psychology and Religion*, the DOAJ lists 1,134 journals. "The Directory of Open Access Journals," DOAJ, accessed November 13, 2021, <https://doaj.org/>.

approach to an open access financing approach already provides a model which could be applied to bibliographic enterprises. Client institutions would not pay for *closed access* anymore, but would then make an *open access* possible through a financing model based on the community of libraries.

### 5.2 *Integration of New Types of Media*

IxTheo reacted to the academic community's need to have the ability to search for all scientifically relevant sources at one central hub – and to obtain a direct access to these sources when possible – by expanding the types of media it catalogues. Traditionally, bibliographies would reference monographs, articles and book reviews. However, digitisation brought along new forms of publications which should be present in a modern bibliography: websites from research projects, databases and, recently, academic weblogs and podcasts. The international GLAM<sup>108</sup> initiative also has a digital basis: Collections from various cultural memory institutions are linked together using common authority records across all disciplines. GLAM plays an important role in Christian and religious art and in archaeology, but the referencing of archive material or material from an author's estate in a bibliography also constitutes a new development. Archival databases and further external resources which provide a standardised and Open Access to their data can easily be integrated into IxTheo thanks to the use and integration of Wikipedia's BEACON<sup>109</sup> format.<sup>110</sup>

*Research data* also come increasingly into focus as a type of medium which will play a more important role in bibliographies in the future. Research data per se are nothing new. What is new, however, is that they are systematically gathered, accessible in electronic form, available when possible in a standardised format and stored according to FAIR<sup>111</sup> principles. Research data produced in a given project and processed in such a way that the results achieved are comprehensible and reproducible or can be used in other research projects play a much more important role in the natural and social sciences (at the moment) than in the humanities. However, an intense discussion is taking place among the younger generation of researchers about the question what constitutes research data and which role they should play in the humanities. This process is still continuing, a generally accepted consensus still has to

108 The acronym GLAM stands for *Galleries, Libraries, Archives, Museums*.

109 "Wikipedia: Beacon," Wikipedia, accessed November 8, 2021, <https://de.wikipedia.org/wiki/Wikipedia:BEACON>.

110 Over 45,000 links to archive material and about 1,800 estates from authors are referenced with links in IxTheo in this way.

111 The acronym FAIR stands for *Findable, Accessible, Interoperable, Reusable*. Cf. "FAIR Principles," Go Fair, accessed November 8, 2021, <http://www.go-fair.org/fair-principles/>.

establish itself. In a broad sense, the digital copy of a printed text or a retrospectively digitised source could be defined as a research datum. But it would not be useful to consider the mere digitisation of analogue entities as research data. This would be analogous to filling old wine in new wineskins. Not the digitised text, but rather the annotated or semantically processed text constitutes a research datum. In theology and religious studies, research data of very different origins may be gathered. This was shown impressively in two surveys conducted among theologians and researchers in religious studies in the context of the German *National Research Data Infrastructure* ('Nationale Forschungsdateninfrastruktur', NFDI). The range of data found includes qualitative interviews, images, audio recordings, semantic word studies, texts processed with TEI and databases.<sup>112</sup> This wide range of data is due to the variety of topics and issues discussed in the theological disciplines and in religious studies as well as their strong inter-disciplinary character. Research data in the humanities are not so much tied to the academic discipline concerned as to the type of media used. This is why humanities consortia built within the major German project of *a National Research Data Infrastructure*,<sup>113</sup> which sets up such consortia in order to address common needs with respect to research data management, platforms and repositories, standardisation and classification as well as research tools, are inter-disciplinary and more interested in the nature (i.e. whether we are dealing with text, images, sound or something else) and function of the data (Text+, NFDI4Objects, NFDI4Memory).<sup>114</sup> Independently of this attempt to build a systematic research data infrastructure driven by scientific policy in Germany, various research data repositories are being developed at the local and international levels as well as within

112 Survey on the topic "research data in religious studies" (4.6.–7.7.2019). Cf. "Umfrageergebnis: Forschungsdaten in der Religionswissenschaft," RelBib, accessed November 8, 2021, [https://relbib.de/Content/survey\\_results#content](https://relbib.de/Content/survey_results#content). The 2020 survey of the theological community has not been published.

113 The research data infrastructure is built with funding from the government at the federal and state levels and is evaluated by the German Research Council (DFG) in the course of three project-funding periods. As of July 2nd, 2021, 19 consortia already receive financial support, such as the consortium *Text+* with its three main areas of interest *collections*, *lexical resources* and *editions*, and which is important for all research based on language and text. Cf. "Datendomänen," *Text+*, accessed November 8, 2021, <https://www.text-plus.org/>. In order to support the academic disciplines as they organise themselves in this process and to build professional structures, the Association German National Research Data Infrastructure was founded on October 12, 2020. Cf. "NFDI: Nationale Forschungsdateninfrastruktur," accessed November 8, 2021, <https://www.nfdi.de/>.

114 *Text+*, accessed November 8, 2021, <https://www.text-plus.org/>. NFDI4Objects, accessed November 8, 2021, <https://www.nfdi4objects.net/>. NFDI4Memory, accessed November 8, 2021, <https://4memory.de/>.

academic disciplines, which will probably lead to the formation of a decentralised and distributed structure analogous to the numerous repositories for digital (textual) data.<sup>115</sup> Specialised bibliographies will play an important role in this context, because they centralise the search for and access to all relevant research data in one hub, thus providing much added value to the corresponding academic community.<sup>116</sup> One can only hope that a higher level of standardisation and classification can be reached in the new research data infrastructures under development than in the usual repositories. This would make it much easier to reuse and cross-link the research data.

The key point is that the whole NFDI project is aligned with the concrete needs of the corresponding academic communities, and it is initiated and supported by academics who are experts in their field. There is a strong parallel here to the foundation of specialised bibliographies in association with journals which had been started by academics, as previously described. The main actors in the NFDI process are not the institutions providing infrastructure for information such as e.g. the libraries, but rather the academics and scientists. However, the great participation of FIDs ('Fachinformationsdienste', specialised information services) in the various consortia as *co-applicants* or *participants* provides a strong indication that the development and long-term running of the NFDI-infrastructure will profit from the involvement and competence of the FIDs, e.g. in the area of metadata, terminologies and standardisation. The FID Theologie as operator of IxTheo supports the theological community in Germany to establish a qualified and efficient handling of research data in the field of theology and research on religion.

### 5.3 *New Needs, New Services: An Added Value for the Academic Community*

The value and benefit of large search engines when tracking down literature is beyond any doubt. I myself took advantage of such tools while searching for literature for this article. It is also clear that search engines cannot replace serious and modern specialised bibliographies. Those in doubt are welcome to try performing a search for a Bible passage on Alphabet's search engine

115 This is also the forecast of Gabriel Schneider and Matthias Landwehr, "Forschungsdatenrepositorium mit einem kooperativen Betriebsmodell: Fallstudie," *O-Bib* 8, no. 4 (2021): 2–3, <https://doi.org/10.5282/o-bib/5732>.

116 IxTheo is currently making a modest beginning in this area with the introduction of the new media type called *research data*, which references at the moment a few research data and initiatives, cf. "Medienart: Forschungsdaten," IxTheo, accessed November 8, 2021, <https://www.ixtheo.de/Search/Results?type=AllFields&filter%5B%5D=%7Eformat%3A%22Research+Data%22>.

Google in order to find relevant research articles on the passage. This is not to rehash the trivial argument that Google too would only find whatever someone somewhere recorded as metadata. This cliché is disproven by Google Scholar, a search machine dedicated to scientific pursuits, which Google LLC itself is developing beside its general search engine. In 2020, the FID Theologie was asked by Google Scholar to put the metadata of IxTheo at its disposal. Google Scholar is therefore actively searching for serious scientific and academic sources which they can integrate in their product. In a process over the course of several months, the VuFind Solr index was optimised so that Google Scholar was able to ‘crawl’ IxTheo’s metadata with an automatic procedure.<sup>117</sup> Google Scholar’s strengths for users lie in its item and keyword search capabilities and in the fact that it provides links to access established specialised bibliographies. Thanks to this collaboration with Google Scholar, the worldwide use of IxTheo has grown significantly.

One of the indisputable advantages of specialised bibliographies is that they allow thematic searches with classifications and subject headings. This is why indexing belongs to the core tasks of a bibliography. According to Heidrun Wiesenmüller, in order to evaluate the quality of indexing, it is not enough to “consider only the input – that is, the knowledge organisation systems and the metadata generated with them. One must also consider the output, i.e. what the search tools does with that input and therefore what is given concretely to the users.”<sup>118</sup> Wiesenmüller describes three central functions of indexing. The *access function* – the so-called retrieval – may itself be divided in three areas: “first the precise search, i.e. the individual search for a particular topic, second the survey-like search, i.e. the comprehensive search for a broader subject, and third the filtering process, which narrows down a set of search results

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117 In the HTML header of the IxTheo bibliographic record, the HighWire Press tag set (a metadata schema) is integrated, which Google (Scholar) can process. This and other formats, which can be selected as part of a configuration, were incorporated into VuFind Release 6.1 with the help of the IxTheo IT developers, so that all VuFind discovery systems worldwide may enjoy the benefits of having them. Cf. “Metadata Vocabularies for Google Scholar (VUFIND-951),” GitHub, accessed November 8, 2021, <https://github.com/vufind-org/vufind/pull/1529>. The metadata are exported in Schema.org to facilitate crawling with general search engines, because Schema.org has many more fields and can better represent hierarchies. This is how we make IxTheo’s bibliographic and person data available to search engines in a detailed and structured fashion.

118 Heidrun Wiesenmüller, “Verbale Erschließung in Katalogen und Discovery-Systemen: Überlegungen zur Qualität,” in *Qualität in der Inhaltserschließung*, ed. Michael Franke-Maier, Anna Kasprzik, Andreas Ledl, and Hans Schürmann (Berlin: De Gruyter, 2021), 279, <https://doi.org/10.1515/9783110691597-014>.

according to their contents.”<sup>119</sup> Wiesenmüller defines the *orientation function* as the “display of subject information in the corresponding bibliographic record” which allows the user to correctly interpret ambiguous and metaphorical titles as well as titles in a foreign language.<sup>120</sup> She describes the orientation function accurately “as the underestimated function of indexing,” because it “is most often not present at all in the mind of librarians and hardly gets mentioned even in relevant handbooks.”<sup>121</sup> The third function is called *exploration*, which means “navigating, browsing and discovering useful things – often without having a predetermined goal (serendipity).”<sup>122</sup> Wiesenmüller develops “quality aspects in catalogues” out of these functions and discusses them with concrete examples.<sup>123</sup> The complete implementation of these suggestions can be a further step in IxTheo as well in order to generate added value for the users.

Many of these suggestions and additional ones which go beyond them, as well as further functionalities which offer added value, are already implemented or initiated. The multilingual full text and metadata search is one of them. Thanks to this feature, the user may perform a search using keywords in his mother tongue and – provided this functionality is activated – search for synonyms and translations at the same time. In this way, texts in a foreign language are also shown in the results without having to perform additional searches with keywords in other languages. Even before the era of globalisation, literature from other language systems was used; in these times of globalisation, it is absolutely necessary to have an international character in order for bibliographies as an information medium to attain a high level of acceptance.

Through our *IxTheo Open Text* initiative, articles from journals and lexicons as well as book reviews are republished open access in consultation with their authors. This service is offered at this time to academics in Germany who can put their articles in a repository a year after their first publication under certain conditions and in accordance with copyright laws.<sup>124</sup> As a precondition, IxTheo must already have a bibliographic record of the article or book review in question so that the full republished text may be attached to it. In connection

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119 Wiesenmüller, “Verbale Erschließung,” 281.

120 Wiesenmüller, “Verbale Erschließung,” 281–282.

121 Wiesenmüller, “Verbale Erschließung,” 282.

122 Wiesenmüller, “Verbale Erschließung,” 282.

123 Wiesenmüller, “Verbale Erschließung,” 286–297.

124 The legal conditions for a second publication on the basis of German copyright laws are compiled in a FAQ list: “Zweitveröffentlichung: FAQs,” IxTheo, accessed November 8, 2021 (Tübingen: Fachinformationsdienste, 2020), [https://www.ixtheo.de/docs/Zweitveroeffentlichung\\_FAQ.pdf](https://www.ixtheo.de/docs/Zweitveroeffentlichung_FAQ.pdf).

with this Open Text initiative, the *ad personam* cataloguing principle was introduced, which refers to the cataloguing of all published works of an author, i.e. all monographs, articles from journals and from lexicons, book reviews and other types of publications. In contrast to the *ad fontes* cataloguing principle, according to which a canon of sources gets systematically processed, the *ad personam* principle leads to the formation of a personalised and complete academic bibliography in IxTheo for the academics who make use of this service. This supplement to the *ad fontes* principle seems especially appropriate as many authors in theology publish in a great number of different journals. The advantage in comparison with the usual bibliographies on academics' web pages is that the bibliography remains permanently in place even when the author changes his/her work place or retires. The advantages in comparison with commercial providers of academic social networks such as Academia or ResearchGate are the completeness and quality of the titles' metadata, the central connection to a specialised bibliography, the files being hosted on servers in Germany, durability and institutional reliability. In the course of 2022, this service will also be offered to academics from other countries who will then be able to republish their articles open access in IxTheo with the help of a user-friendly upload form.

From October 2021 on, the *Open Text* initiative is supplemented by the introduction of *Person Information Pages* in IxTheo. The standard functionality in discovery systems – such as VuFind – makes it possible to search for an author's works, but not to search for information on an author. Person information pages fulfil just this task.<sup>125</sup> They display literature from and on an author, information on that person from his/her authority record, the number of publications every year in a chronological bar chart and links to external resources. In addition, the visual representation of topics on which the author published and the list of related persons provide a good overview of the author's academic network, as far as it manifested itself in collaborative publications or editions.

A further step in the representation of an author's academic network is the integration of *citations data* which reveal something about intellectual relationships between persons. IxTheo is not interested in using citations data to produce bibliometric data for the evaluation of theologians' research output, but rather wants to make the influence or reception of theological works and concepts visible. For instance, to which persons and theologies does Karl Rahner refer and, conversely, who quotes the works and concepts of Karl

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125 Cf. as an example the person information page "Rahner, Karl 1904–1984," IxTheo, accessed November 8, 2021, <https://www.ixtheo.de/Authority/135640857>.

Rahner? Two conditions must be fulfilled in order to have the ability to process citations data on a large scale: Firstly, the publications' bibliographies must be recorded in a structured fashion and secondly, these data must be made available as *linked open data* so that they can automatically be reused and don't have to be recorded several times. A corresponding international initiative was founded under the name OpenCitations,<sup>126</sup> which is supported worldwide by well-known universities such as the KU Leuven since 2020. In Germany, various cooperation partners are working on this issue, because such an enormous task can only be fulfilled through national and international partnerships from libraries and data providers. Timotheus Chang-Whae Kim and I formulated an application scenario for citation data in IxTheo for the project *Linked Open Citation Database* (LOC-DB)<sup>127</sup> run by the university library in Mannheim.<sup>128</sup> This constitutes a very large field of activity for a cooperation between larger theological bibliographies, because citation links in older theological literature cannot be easily and automatically processed as in the case of current literature where DOI-to-DOI comparisons are possible.

All the services described above, which are already partly implemented, go much further than search engines (whose usefulness no one doubts) and provide a considerable added value to the academic community.

#### 5.4 *New Services Support Innovative Research Approaches and New Processing Techniques*

Innovative research approaches, such as methods from the Digital Humanities (DH), play an increasingly important role in the humanities, and also in theology and religious studies. This is reflected, for instance, in the foundation of corresponding research networks such as 'TheoLab – Forschungsverbund

126 The initiative *OpenCitations* provides under the leadership of both directors, David Shotton (Oxford e-Research Centre, University of Oxford) and Silvio Peroni (Department of Classic Philology and Italian Studies, University of Bologna), over 1,8 Billion DOI-to-DOI citation links. Cf. OpenCitations (@opencitations), "1.8 billion #DOItoDOI citation links," Twitter, September 9, 2021, <https://twitter.com/opencitations/status/1435963691980103685>. On the history and goals of OpenCitations cf. Silvio Peroni and David Shotton, "OpenCitations: an Infrastructure Organization for Open Scholarship," *Quantitative Science Studies* 1, no. 1 (2020): 428–444, [https://doi.org/10.1162/qss\\_a\\_00023](https://doi.org/10.1162/qss_a_00023).

127 "Linked Open Citation Database," accessed November 7, 2021, <https://locdb.bib.uni-mannheim.de/blog/de/>.

128 Timotheus Chang Whae Kim and Martin Faßnacht, "Anwendungsszenarien im Index Theologicus (IxTheo)," lecture held at the second LOC-DB Workshop on November 6, 2018 in Mannheim, accessed November 7, 2021, <https://slides.com/timotheuskim/anwendungsszenarien-im-index-theologicus-ixtheo>.

Digitale Theologie' (TheoLab – research group on digital theology),<sup>129</sup> at the Protestant theological faculty at the University of Heidelberg in cooperation with the 'Forschungsstätte der Evangelischen Studiengemeinschaft' (FEST, the Research centre of the Protestant student community) or the series *Introductions to Digital Humanities – Religion* published by De Gruyter.<sup>130</sup>

According to Tim Hutchings and Claire Clivaz, DH originated in the attempt to analyse digital texts with the help of computer programs.<sup>131</sup> This concern goes much further than the mere need to read texts digitally in order to have access to academic content independently of time or place. But both concerns have one point in common: They both require the digitisation of texts. The difference between them is that in DH, very large text corpora are examined, and the ability to download a single digital text accessible through licensing or open access from a given platform is not enough anymore. For instance, the FID Theologie provides manual access on demand to large amounts of text from an IxTheo digitisation project<sup>132</sup> to the DFG research group 2973, 'Katholischsein in der Bundesrepublik Deutschland' (To be Catholic in the German Federal Republic).<sup>133</sup> It is foreseeable that researchers will want to access the digital text corpora themselves. There is a need for action in the medium term, because supply mechanisms and eventually DH tools as well can be integrated more directly and comfortably in IxTheo. Not everyone needs the whole gigantic full text corpus; researchers restrict their research to partial corpora which they can select themselves according to thematic and chronological criteria. For instance, the research group mentioned above only needs Catholic sources from the years 1965–1989/90. Our goal would be to have the source selection made in IxTheo, and then the requested corpora could be downloaded through an API.

129 "TheoLab: Forschungsverbund Digitale Theologie," Universität Heidelberg, accessed November 8, 2021, <https://www.uni-heidelberg.de/fakultaeten/theologie/forschung/theolab.html>.

130 Claire Clivaz, Charles M. Ess, Gregory Price Grieve, Kristian Petersen, and Sally Promey, eds., *Introductions to Digital Humanities – Religion* (Berlin: De Gruyter, 2019–2022), accessed April 1, 2022, <https://www.degruyter.com/serial/idhr-b/html> (as of April 2022, volumes 1, 2, 4 and 5 have been published).

131 Tim Hutchings and Claire Clivaz, "Introduction [What is Digital Humanities?]," in *Digital Humanities and Christianity: An Introduction*, ed. Tim Hutchings and Claire Clivaz (Berlin: De Gruyter, 2021), 1, <https://doi.org/10.1515/9783110574043-001>.

132 In the digitisation project *DigiTheo 5*, approx. 160,000 articles and book reviews from 71 theological journals are digitalised and made available open access.

133 "Katholischsein in der Bundesrepublik Deutschland: Semantiken, Praktiken, Emotionen in der westdeutschen Gesellschaft 1965–1989/90," accessed November 8, 2021, <https://www.katholischsein-for2973.de/>.

Larger bibliographies must expand their range of services in such a way that innovative research approaches such as data and text mining<sup>134</sup> methods, methods from Digital Humanities, artificial intelligence (AI) and machine learning (ML) procedures as well as new, unknown processing techniques may be used on the material at hand.<sup>135</sup> The needs must be determined and analysed in a continuing and close dialogue with the academic community, because specialised knowledge of methods and research approaches is required in order to accurately define the range of services to offer in this area. If there are corresponding application scenarios, large theological text corpora could be prepared before they are downloaded for research purposes and made available under an open license, e.g. in the form of stemming, lemmatisation or as N-grams.<sup>136</sup> In this process, the difference between open and closed access to corpora must be kept in mind. It is clear that research can be conducted in many other ways and more efficiently with open as with closed corpora. In connection with this, it is interesting to note that the *InternetArchive* published on October 7, 2021 its *General Index* under a *CCO 1.0 universal* license.<sup>137</sup> Over 107 million journal articles are published there as N-grams. The reason for this publication probably has to do with copyright laws, since the General Index “[is] non-consumptive, in that the underlying articles are not released, and it is transformative in that the release consists of the extraction of facts that are derived from that underlying corpus.”<sup>138</sup> New possibilities for action may arise in this area for large bibliographies with regard to their range of services. All in all, we should remember that new developments in modern computer-assisted processing methods and procedures come at a very fast pace, and Clifford B. Anderson’s assessment is certainly accurate: “The shift to

134 On the differences between data mining (structured data) and text mining (unstructured data) cf. Eugen Klass, “Data Mining und Text Mining: kleine Unterschiede, große Wirkung,” *Wirtschaftsinformatik & Management* 11, no. 4 (2019): 267–268, <https://doi.org/10.1365/s35764-019-00178-6>.

135 The ups and downs in the development of artificial intelligence provide a good example of how fast procedures can lose relevance and their reputation because of false promises, and how long it takes before sensible and efficient application scenarios can be developed. Cf. Irene Teich, “Meilensteine der Entwicklung Künstlicher Intelligenz,” *Informatik Spektrum* 43 (2020): 277–278 (esp. Abb. 1), <https://doi.org/10.1007/s00287-020-01280-5>.

136 “N-gram,” Wikipedia, accessed November 8, 2021, <https://en.wikipedia.org/wiki/N-gram>.

137 “The General Index,” *InternetArchive*, accessed November 8, 2021, <https://archive.org/details/GeneralIndex>.

138 “Declaration of Support for the General Index,” *InternetArchive*, accessed November 8, 2021, <https://archive.org/details/GeneralIndex>.

digital humanities promises closer collaborations between scholars, archivists, and librarians.”<sup>139</sup>

Whether and how text mining and data mining can be used in the future while indexing monographs and articles in larger bibliographies, remains to be seen, but we should reckon with this development because of the fast progress being made. Attempts to determine classifications by using title data or abstracts have not been promising so far. This is why we introduced in IxTheo the full text search as a third way of content indexing – in addition to our own basic indexing with IxTheo-classifications and to subject indexing –, so that users may find topics which neither appear as keywords in the title nor are attributed as index terms in the process of subject indexing. This search covers all available open access full texts, but also closed access full texts which cooperating publishers made available. In the medium term, an automatic indexing with classifications might be successful on the basis of full texts. Some techniques are already being used in IxTheo to reliably determine the language of an article in the course of our automatic cataloguing procedure in order to display it in the corresponding bibliographic record and in facets. This information is often not included in the metadata which publishing houses provide on their web sites. For this purpose, the parser library *Apache TIKa* is used which applies N-gram algorithms and also achieves good results with short texts.<sup>140</sup> In this way, text and data mining procedures can help to improve the bibliography as a product. But this would not be the main purpose. The main purpose is to make open materials available to research in the spirit of *open science*. The decisive question in that regard is: “How can librarians and archivists make their collections accessible to digital humanists?”<sup>141</sup>

## 6 Conclusion

The question posed at the beginning of this chapter, whether the history of theological bibliographies is characterised by volatility and disruption or, on the contrary, by innovation and alternatives, can now be clearly answered. There was a disruption when a number of bibliographies which were counted among the most important bibliographies in their heyday ceased publication.

139 Clifford B. Anderson, “About this book,” abstract on the website of the book: *Digital Humanities and Libraries and Archives in Religious Studies: An Introduction*, ed. Clifford B. Anderson (Berlin: De Gruyter, 2022). <https://doi.org/10.1515/9783110536539>.

140 TIKa – Language Detection, accessed November 8, 2021, [https://www.tutorialspoint.com/tika/tika\\_language\\_detection.htm](https://www.tutorialspoint.com/tika/tika_language_detection.htm).

141 Anderson, “About this book.”

The reasons for this are complex and include a shortage of personnel, institutional or organisational factors and the choice of medium. The transition from the printed to the electronic version – or, to put it in more abstract terms, from the analogue to the digital paradigm – proved to be unmanageable for many bibliographies. This is something to think about for everyone who agrees with the assessment that a new change of paradigm is emerging: from *closed science* to *open science*.

The attempt to build a large-scale 'Information und Dokumentation' (IuD, Information and documentation) for the humanities in Germany in the 1970s and 1980s may be described as volatile. The failure of this process could have led to the termination of the efforts in Tübingen to produce a modern theological bibliography. But the ups and downs for the people involved back then did not lead to the abandonment of the search for the best up-to-date information media, but prompted newcomers to look for new solutions. In this way, volatility may contribute something positive in the end and maybe even comforting: the recognition that new people bring new ideas and competence, with which they stand on the shoulders and accomplishments of their predecessors and find practicable solutions in keeping with the times.

On the whole, however, the history of theological bibliographies can be written has a history of innovation. In competition with other providers – we know each other, there are lively discussions (thanks to BETH among others) and we learn from each other –, the instruments were constantly improved, the content processed was continually expanded and the technical capabilities of the time were used in the best way possible. It is interesting to note that partnerships with other bibliographic enterprises could only be established recently. The organisational and technical barriers, probably the linguistic differences and geographical distances as well, were obviously too great. Attempts to build a cooperation between IxTheo and ATLA remained short-lived,<sup>142</sup> an intended cooperation in 2011 between IxTheo and the *Elenchus bibliographicus* (ETL.EB) did not bring any result. However, competition between these three larger bibliographies led to a natural concentration process at the local level. In Chicago,

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142 The executive director of ATLA, Albert Hurd, contacted the UB Tübingen in writing already in 1990. The later directors Dennis A. Norlin (executive director of ATLA) and Berndt von Egidy (director of the UB Tübingen) concluded a *Memorandum of Understanding* in 1997, which basically defined an operational cooperation. In return for a fee, ATLA commercialised the *Zeitschrifteninhaltsdienst* (ZID) of the UB Tübingen as a CD in North America. It cannot be determined with certainty how long the cooperation lasted. The last invoice is dated in 2001. Since the ZID was commercialised from 2002 on by the publishing house Mohr Siebeck, the cooperation with ATLA probably ceased at the end of 2001.

various bibliographies and abstract services such as the *ATLA Catholic Periodical and Literature Index* were integrated in the *ATLA Religion Database (RDB)*; in Leuven, both printed bibliographies, the *Revue d'histoire ecclésiastique* (RHE.B) and the *Elenchus bibliographicus* (ETL.EB), which each had its own web site, were merged to become the *Index Religiosus*; and in Tübingen, the FID Theologie integrated its database of journal articles as well as its monographs and other sources in the new *Index Theologicus*. These databases grew significantly and by leaps and bounds in the process and now offer much more comprehensive search capabilities to the current academic generation than to earlier ones. But the natural concentration processes are also exhausted at every location.

In Tübingen, innovations now come through a change in the strategy: separation from the publishing commercialisation partner, development of technical competence in modern discovery systems, development of cooperation capabilities and a consistent focus on open access. In this way, new cooperation partners could be found and the development of IxTheo could be put on the shoulders of a much broader specialised community which contributes its capabilities, ideas and manpower to our common project. The orientation of all activities along open access principles made it possible to integrate new sources, informational tools and services, which have made IxTheo more attractive in the eyes of the academic community.

The needs of the academic community as a whole and of individual groups which turn to new research approaches and techniques will develop further in the future and require a lasting commitment to performance and innovation in order to offer a sensible and important contribution to the information extraction and supply for theologians under the new leading paradigm of open science. The keywords in this endeavour are *open access* and *cooperation*.

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