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I. Introduction

In the beginning there was just the Institute for Marine Research in Bremerhaven. It was a very small marine research institute with just one librarian and a part time library assistant to provide service to less than 63 full time research scientists in the field of marine biology, chemistry and marine physics. In 1981 the Alfred Wegener Institute for Polar Research opened its doors with one librarian and about the same number of scientists. Both institutes merged in 1986 under the new name Alfred Wegener Institute for Polar and Marine Research. There were now 2 librarians and one fulltime library assistant. The number of employees had increased to 149

At the beginning of 1999 the AWI had 2 librarians and one library assistant providing services to less than 507 potential library users and it was in that year that the Biologische Anstalt Helgoland in Hamburg was merged with the AWI and its library moved to Bremerhaven. The Alfred Wegener Institute Foundation for Polar and Marine Research now has 4 librarians, 1 fulltime and 3 part-time library assistants. and has 684 employees.

II. Interlibrary Loan

In the years from 1979 to 1987, or pre Internet, the library had limited bibliographic tools with which to verify interlibrary loan requests and to ascertain possible lending libraries. Available to the library were the World List of Periodicals and the Biosis list of serials, useful for deciphering journal abbreviations. The University of Bremen Library had placed a microfiche of its holding, as well as yearly retired copies of Books-in-Print and Ulrichs Guide to Periodicals at the library's disposal. The library had also acquired a early German union catalog of periodicals on microfiche, ZAG. Bremerhaven is not a university town and there is only one small academic library at the technical college located in Bremerhaven. The nearest university library is over 65 kilometers away in Bremen.

Verified requests of periodicals were sent directly to lending libraries when locations could be determined and unverified forms were sent to the University of Bremen Library for verification and further processing. The University of Bremen was a major supplier of books and photocopies.

Library patrons placed their requests by filling out a one part form. These requests were verified and typed out onto red and green ill cards with an additional carbon copy for the libraries own records. These forms were then either mailed or sent by courier to Bremen. Few requests were sent to international addresses.

The computer age dawned on library ILL processes starting in 1987 with the beginning of online access to bibliographical databases. The library now had access to Dialog, STN, ESA, Orbit, and DIMDI and thus to many databases like *Chemical Abstracts*, *Biological Abstracts*, *Books-in-Print*, and some library catalogs also became available such as the *Library of Congress MARC*, the *Technische Informations Bibliothek at the University of Hannover* and the *Deutsche Bibliothek* which facilitated bibliographic verification of requests. The first use of the IAMS LIC BB was made in 1988 for requesting items not available in Germany. Also CD-ROM tools such as *ASFA*, *PolarPAC* and the German Periodical Database (*ZDB*) greatly facilitated verification and locating lending libraries.

Access to Melvyl and the Scripps Institute of Oceanography collection was made in 1989. This enhanced verification greatly but did not mean a need to borrow directly from Scripps. ILL libraries were almost always found closer to home. Loan requests were still placed by type-written forms sent out by mail or courier.

Toward the close of 1995 the World Wide Web and the Intranet transformed the way in which ILL was conducted at the AWI. The exponential growth of German libraries with online access to their collections as well as the formation of the new union catalog collection of the GBV greatly assisted verification and location of appropriate lending libraries. Now borrowing directly was possible obviating needing to use the University of Bremen Library as a routing center, thus increasing the speed with which requests could be processed.

The transformation of handwritten unverified requests to type forms had always been a labor intensive process and the advent of the internet provided a technology that could be used throughout the institute for researchers to place their ILL requests. An intranet site was already in place and pages were written for the library among which was an ILL page. This page was an electronic order form for either books or periodical articles. Bibliographic information was thus entered into a Sybase database that could then be downloaded into the library's own integrated system. No longer was it necessary for library personnel to key in the bibliographic information from handwritten request.

The library's ILL database, which was powered by the relational database *DataEase*, was able to generate full patron information i.e. full name, telephone, address, and working groups as well as automatically transforming abbreviated periodical titles to their full form including possible library locations (should there have been a prior request for the serial) Now requests could be printed out from the database onto the appropriate German ILL forms: University of Bremen, regional libraries, and special libraries. Returned request whether filled or unfilled, whether photocopies or books loans could be processed and filed within the ILL database. No longer was it necessary to file and store copies of ILL request, another reduction in task time. Duplicate orders could also be automatically identified, eliminating superfluous redundant orders being placed. ILL requests were downloaded daily and batched for printing and mailing to loan libraries each Friday.

III. Intraleihe

With the merger of the Biologische Anstalt Helgoland (BAH) and the AWI, the library now had an additional service to provide materials to the research stations on Helgoland and Sylt. Since 1992 the research station at Potsdam had already been sending by courier internal request forms. These were later downloaded directly from their ILL database to speed up the delivery time. The BAH Library in Hamburg had supplied copies of journal articles by mail and courier. Recent journals were also sent out or routed to the island research stations, additional copies were kept for some frequently or heavily needed journals. The printed version of *Current Contents* was subscribed and also made available as were photocopies of the table of Contents from many held journals. No intraleihe or document delivery was provided for researchers in Bremerhaven even though the institute is housed in eight separate buildings throughout Bremerhaven, albeit all within 15 minute walking distance from the central library.

IV. The Challenge

Faced with the task of providing ever more services with fewer personnel, increasing turn around time and the rising cost of journals, it was quickly decided that routing journals, providing duplicate copies and massive photocopying and postal mailing was costly, ineffective and expensive. Routing journals to distant research stations removed issues from the hands of users in Bremerhaven or any of the other research stations. Tracking and mailing journals was a labor intensive task. Photocopying was also costly and mailing copies was time consuming and postage rates were not insignificant.

Interlibrary loan request from the island research stations also needed to be considered and how they could be provided with faster service with less hands handling the materials.

V. Solutions

The dawning of the electronic journal, made possible by the internet, pdf and html document file standards, paved the way for increasing services, lowering costs and speeding delivery. The library now as consortial agreements with Elsevier, Wiley, Academic, Kluwer-Academic, Science and Nature. Many other electronic journals are included with their print subscription at no additional costs, as is the case with Springer publications. Not only does the library now provide online access to journals to which it subscribes but it also has expanded its holding to journals for which it has no print holdings. This situation has enhanced the document delivery for the research stations in Potsdam and on Helgoland and List, and also the researchers in Bremerhaven profit from this development. Many interloan requests are now unnecessary due to the consortial agreements that have made many more journals available as online full-text.

The inception of *Subito* was the beginning of electronic ordering and delivery of periodical articles throughout Germany. At a cost of DM7.00 for 3 days turn around or DM34.00 for 24 hours turn around, it is possible to place orders directly with a lending library that is capable of scanning journals articles and faxing, mailing by post or sending via email. This means that orders can be quickly passed on to distant research stations without repackaging and remailing. After joining the GBV in 2000 the AWI could use the electronic ILL ordering system at no additional costs. This however did not include scanning documents and sending them as email, which is most unfortunate. Also, the orders to have to be keyed into the system. There is no way of automatically transferring orders from the AWI ILL Database into the GBV or Subito system, although Subito does provide for bibliographic citation input for journals after 1995 in conjunction with Swets Online Contents.

The library patrons at our distant research stations required special considerations so as to have efficient un-bureaucratic access to the library's collection. It was decided that request could be placed with email and a special email address was established only for intraleihe. The link for the intraleihe was conveniently placed on the same page as the start page of our online-catalog with a note that it was not to be used by researchers in Bremerhaven.

As early as 1999, before the library collection of the BAH Hamburg and AWI Bremerhaven were merged in Bremerhaven, it was recognized that a good high speed book scanner would be needed to provide copies of journal articles to the scientists working on Helgoland and on Sylt. Ariel was only briefly considered but was not a serious contender as it was not necessary with the present technology to deliver either TIF or PDF files directly to the end user. In 2000 the decision was made to purchase the *BookEye Scanner* from the *Image Ware Company*. In addition a *HP Scanjet* was acquired for high color resolution scans of tables and pictures should

they be required. The *BookEye Scanner* can scan up to 300 dpi with gray scales and it sufficient for most articles request, however, should a user request greater resolution for better table or picture quality, the pages in question are rescanned and emailed. Now the photocopiers are rarely used by the library to deliver documents, and email is almost exclusively used for delivery. Every researcher at the institute has a computer with internet access and email. Adobe Acrobat Reader is standardly installed and scanned documents are emailed as pdf files.

The electronic full-text journals available to the research stations reflect the library print subscription holdings and more. This means for titles beginning with 1993 or 1995 no intraleihe order need be placed. This reduces the time and effort on the library part meeting these demands for information. Journal routing could also be eliminated thanks to the advent of internet websites of journals, which even if they should or do not provide full-text edition, generally do offer the table of contents and abstracts of available issues. Initial requests from Helgoland and Sylt for copies of table of contents proved that for all but three journals online sources were already available that could be freely accessed. For the journals without online table of contents, these are scanned in Bremerhaven and posted on the library's web page for electronic journals. Journal routing is a thing of the past!

Obviously books are still required and requested. Alas, this does mean the library has to package and prepare for mailing books to be sent out on intraleihe. The institute, unfortunately, has no mailing room that does packaging. Books requested on interlibrary lending are also first sent to Bremerhaven before they can be repackaged and mailed on to the island stations for loan. This does mean some loss in time for delivery and use!

VI. The Future

Interlibrary loan in Germany has under gone revolutionary changes within the past five years. The increase of regional union catalogs and cross union catalog searching such as the *Karlsruhe Virtuel Catalogue* has made verification and access to documents faster and easier than ever before imagined. The system software developers of *GBV* will carry *PICA* forward to updates that promise more comfort of use and greater access to international libraries for ordering documents as well as implementing journal contents features to implement online ordering of journal articles, thus reducing keying in bibliographic information. This is called *PICARTA*. There will be better access to dissertations throughout Europe and within Germany the prevalence of electronic full-text dissertations will increase which presently is still larger in a project stage.

Intraleihe will profit from the expansion of electronic journals and the retrospective digital conversion of journal collections as in the *JSTOR* project. This means older journals on the shelves while not necessarily be dispensed but rather could be complemented with additional electronically access at nominal cost. In time, more books will be available electronically and it seems not overly speculative to assume that proceedings will be prime candidates which would appeal to the scientific community for sale as electronic versions. In many cases the entire proceedings volume is never truly needed just a few chapters or papers from it. At present CD-ROM titles are loaded on to our networked servers and copied onto virtual drives, this makes more sense then circulating them as physical volumes.

VII. Summary

Librarians are still necessary to verify many interlibrary loan requests. All too many citations are incomplete, incorrect, and unclearly abbreviated. The library patron needs professional assistance in such cases. Librarians have the skill, training and tools to provide accurate verification of bibliographical citations and to track down lending sources. This notwithstanding, it is not helpful or necessary for researchers to be impeded by the information professional when the way is clear to finding and obtain the required document. The researcher should be able to place direct orders for materials when it is clear that the library does not hold the items needed. The problem is cost. Who pays for misuse of direct ordering? Who decides if an order is highly crucial to warrant 24 hour fax or email delivery at 35 DM or more? Should the library carry these costs or should the user or his research section. Still too much time is wasted re-keying user request information into the document delivery system, and time wasted re-routing the material to the user. A more efficient, cost effective and expedient way must be found to better handle future document delivery to our patrons.