THE INTEGRATION OF MANUAL AND COMPUTERIZED INFORMATION
SERVICES AT THE CENTRE FOR AGRICULTURAL PUBLISHING AND
DOCUMENTATION IN WAGENINGEN, THE NETHERLANDS

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Introduction

The Centre for Agricultural Publishing and Documentation, or Pudoc
for short, is a legal entity under the Ministry of Agriculture and
Fisheries of the Netherlands. Within the Ministry, it is directly
responsible to the Directorate for Agricultural Research. (There
is at the moment no formal relationship with the National Agricul-
tural Library. The latter belongs to the Agricultural University,
also located in Wageningen.) According to its charter, Pudoc has
the aim to advance agriculture through publishing and documentation
activities.

With regard to publishing, this aim should be achieved through
assisting agricultural research bodies in editing and publishing
their work, issuing publications, advising on grants to scientific
journals in which agricultural research bodies publish their
findings, arranging and editing translations and training agricul-
tural editors. All these functions are in fact carried out more or
less intensively. The publishing department is actually a medium-
sized scientific publisher which produces some 35 titles per year.
The monographs published are mainly manuscripts that are not
attractive to commercial publishers, but still deserve professional
production and distribution. This department employs at the moment
a staff of eleven people.

Before discussing the documentation department, I should also mention
our well-edquipped printing plant which serves the agricultural
community. Recently the printing office has developed more into a
brokerage and advisory service for a rapidly increasing volume of
printing jobs with its own facilities as backup.

The Documentation and Information Department

The official tasks of the Documentation and Information Department
are the following: to provide a central literature documentation
and information service in agriculture, and maintain contacts with
special literature documentation services, to supply information
from the agricultural literature, to issue publications arising from
these activities, to give advice and instruction on literature
documentation, to improve and elaborate classification systems for
agriculture and develop documentation techniques. These tasks are
very broad indeed! They certainly do not get all the same, emphasis
and they are all carried out within the rather severe limit of
personnel and money. The present distribution of work is probably
best illustrated by a breakdown of the present staff of the depart-
ment, as is given in the following table:

Staff of the documentation department

1	department head
1	department secretary
3½	documentation strictu sensu
	2 'Landbouwdocumentatie'
	1 'Pudoc Bulletin'
	½ 'Euromarktlijst'
2½	manual current awareness
1¼	computer current awareness
¾	AGRIS input
4	bibliographies and literature reviews

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The activities of the documentation department can be divided into two types, depending on who takes the initiative: Pudoc itself or its clients.
Services initiated by Pudoc itself are first of all three regular publications:
Landbouwdocumentatie, which means 'Agricultural Documentation', is a weekly bulletin in Dutch with abstracts of general interest to agricultural scientists, extension officers, agri-business etc. in the Netherlands, selected from the world literature in West European languages,available at the University library and the Library of the Ministry of Agriculture and Fisheries. It has about 5,000 titles per year.
Pudoc Bulletin is a quarterly bibliographic title list of publications on agricultural research by Netherlands scientists, with approximately 2,000 titles per year.
Agricultural Aspects of the Common Market is a monthly list of publications related to agricultural affairs of the European Common Market. It has about 2600 titles per year.
All these three publications are in fact information services which we initiate ourselves, in contrast to information services provided at the request of specific clients.
Another activity which we carry out for an impersonal audience is the preparation of input for the AGRIS system of the FAO. For this system, bibliographic descriptions are made of all documents published within the Netherlands, and within the scope of agricultural sciences.
Pudoc makes and maintains two documentation systems for its own use: one is the card file of all entries into 'Agricultural Documentation' and the other is a file of all bibliographies compiled on request, to which various other bibliographies are added. These documentation systems are used as a first resource in answering requests for information, but Pudoc relies most heavily on documentation systems made by others. We have ourselves a (substantial) reference library and are probably the most frequent users of the reference library of the Agricultural University.

After having discussed the information services provided on Pudoc's own initiative, I shall now describe the information services provided at the request of individual clients. We offer four different types of these services:

- a current awareness service, whereby people are alerted to new
literature which has appeared in their special field of interest.
This service is provided both by a manual and a computer system.
It is a subscription service, whereby the titles are provided
regularly as they appear in the primary literature for the manual
service and in the secondary literature for the computer service.
The three other services are replies to once-only enquiries:
- answers to very simple questions, which can be provided with a
minimum of effort.
- bibliographies, whereby a list of relevant titles is made for
specific queries These bibliographies can range from a few books
on a certain general subject to a bibliography for a dissertation
which should be as complete as possible.
- reviews of the literature whereby the literature is not only com-
piled but also analyzed and made into an evaluative or state-of-the-
art report.

The current awareness services and the compilation of bibliographies
on request will be dealt with in more detail, but before doing so,
I will discuss first the groups of people we try to serve.
Pudoc's clientele is potentially very large because Pudoc's task is
to serve the whole agricultural community in the Netherlands. It
also deals with foreign requests, although they get a low priority.
In practice, most of our clients are workers in agricultural research.
Information for farmers is the responsibility of the extension
service. Information for the extension service can be Pudoc's respon-
sibility but requests from that area are only incidental. The weekly
publication Agricultural Documentation has extension officers as one
of its target groups to keep them generally up to date with scien-
tific developments. General information about agriculture in the
Netherlands for all kinds of non-professionals is also dealt with
at Pudoc to some extent, although the Directorate for External
Relations of the Ministry of Agriculture has a special service for
such people. Agricultural researchers can, of course, come from a
wide variety of institutions such as private industry, the Agricult-
ural University, non-profit research institutes and governmental
research outfits both from within the Ministry of Agriculture and
from other ministries.
Work is generally done on a first-come first-served basis. However,
when delays build up, work for the Ministry receives priority. To
fulfil all Pudoc's functions, the staff of about 40 is extremely
limited. We have not advertised our services, apart from book
publishing, but have been satisfied to serve those who knew where
to find us. If everyone had known we made bibliographies and even
sometimes reviews free of charge, we would have been snowed under.
The relatively early introduction of computer services was certainly
motivated by the idea that we might be able to do more for more
people without an appreciable increase in staff.

The current awareness services
The manual current awareness service is based on all periodicals
arriving at the central library of the Agricultural University. Some
150 are processed daily. These journals are scanned for articles
which seem relevant for one of the 40 clients of the service. Many

clients have a standing order for photocopies of those articles
judged relevant for them by the screener. This service has two
special qualities: the availability of the full document is
guaranteed; and it is possible to specify almost any selection
criterion because the full texts of the original documents are
actually seen by an information specialist. The service is limited
by the journal collection on which the service is based, and by the
fact that we cannot employ more than one person for this job. (Differ-
entiating between 40 interest profiles is a remarkable feat for one
person.) It is a very labour-intensive service. These limitations
prompted our interest in the use of computer retrieval for selective
dissemination of new information. After some preliminary work in
1972, we started with a feasibility study in 1973. This study was
called the ALADIN project which stands for Automatisering van
LAndbouwkundige Documentatie en Informatie in Nederland (Automation
of agricultural documentation and information in the Netherlands).
The aim of this project as a) to investigate the technical feasibility
of a computer-based current awareness service for agricultural
research in the Netherlands and b) to compare the quality and cost
of such a service with those of the existing manual current awareness
service. The project was originally financed by the Netherlands
Organization for the Advancement of Information Services (NOBIN).
Under the project 100 people received monthly output from CAIN and
where relevant from Chemical Abstracts Condensates, Biosis Previews,
Food Science and Technology Abstracts and Medlars. The project as
such ended in April 1975 when the financing was taken over by the
Ministry of Agriculture and Fisheries. It is now one of Pudoc's
regular services. The feasibility study itself can be considered a
success: the service has proven to be technically feasible. It with-
stood the comparison with the manual service very well indeed,
although it cannot outperform the manual service in all aspects.*
The main advantage of the computerized current awareness service is
that there are virtually no technical limits to growth. Our
computerized service is also clearly cheaper than our manual service;
the difference calculated as cost-per-relevant-title is even larger
than that based on total subscription cost. The total cost for the
computerized service is of course very dependent on the number of
data bases processed, the number of search terms used and the number
of titles in the output. For the manual service the search costs
are virtually fixed. It only costs secretarial time to type an alert-
card for every title found.
The increase in the number of clients for the computerized SDI service
is limited mainly by personnel to construct and monitor new profiles
(in our experience, one person can construct and monitor a hundred
new profiles a year) and by money, or, to be more precise, the effort
needed to convince potential clients that the service provides value
for money. The number of profile formulations for the Pudoc SDI
service was 116 in December 1975, 152 in December 1976, 252 in December
1977 and 282 in March 1978. We expect to reach 350 by the end of this

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* Jan van der Burg & Hendrik C. Molster: Results of a comparative
  study between a manual and a computerized current awareness service.
  Proceedings of the European Regional Congress of Agricultural
  Librarians and Documentalists (IAALD), Hamburg, 17-22 April 1978.

year. These figures refer to the number of subjects for which the various data bases are searched. These are different from the number of profiles per data base. At the moment we process the data bases of CAIN (now called AGRICOLA), FSTA, CAB and AGRIS under our own jurisdiction. We act as intermediary for quite a number of profiles on Chemical Abstracts, which are processed with the same software on the same computer, but for a different organization and for Biosis, which is processed by the Biological Information Service in Nottingham, U.K.

In March 1978, the number of profiles run on the various data bases were 135 on AGRICOLA, 159 on CAB, 91 on AGRIS, 46 on FSTA, 29 on Biosis, and 56 on Chemical Abstracts, making a total of 516. Because the number of profile formulations was 283, the number of data bases used per profile was on the average 1.8.

At present the choice between the manual current awareness service and the computer-based service is usually made by Pudoc itself based on the perceived needs of the client and the possibilities of both services. The manual service works more or less at full capacity and cannot accept new clients easily. At the moment it is difficult to increase the staff for the manual service because the real costs are much higher than the price we charge. To what extent labour costs should be recovered from clients in a governmental organization has always been a difficult question. When the service first started, the price we asked was considered high in relation to the other services which were free or very cheap. But over the years we have not increased the price very much, whereas labour costs have increased heavily. Thus, at the moment the price for the manual service is about 1/6th of the actual cost.

The price for the computer service was originally fixed at the average of the price for the manual service in order not to provoke any competition. This principle will probably be adhered to in the near future. The present price for the computer service more or less covers the cost of the computer but not that of the staff. Although it is not likely that the manual service will be increased in the near future, it is also not likely that it will be discontinued because the screening of journals has to be done anyway for our AGRIS input, for Pudoc Bulletin and for some other purposes.

Bibliographies on request

It has long been one of the major activities of Pudoc to make bibliographies on any subject within the field of agriculture in its broadest sense on the request of interested persons. Prior to 1975, this service was free but not greatly publicized. The main information sources used for the compilation of these bibliographies were the major bibliographic journals, various other once-only bibliographies, reviews, the holdings of the Agricultural Library at Wageningen especially with regard to handbooks and reference works, and informal contacts with specialists.

In 1974, the first connection was made between the terminal at Pudoc and the Lockheed computer in California to test the new possibilities that on-line information retrieval offered. Since that time, we have become enthusiastic adepts of this information tool as it provides immediate access to a large variety of bibliographic sources with a much reduced effort. Parallel to our experience with the current awareness service, computer searching has increased our labour productivity quite substantially, even though the total cost per search is not much lower than that for a manual search. For a bibliography made in the traditional way, we reckon an average of 5 man-hours.

Our average computer connect-time for one question is about 40 minutes
to which the time for the interview, preparation for the search and
control of the output should be added, totalling roughly one and a
half man-hours. Present labour cost for a junior information specialist
are Dfl. 48 per hour, and computer costs are approximately Dfl. 5 per
minute. An average manual search would thus cost Dfl. 288 (6x Dfl. 48)
and a computer search Dfl. 272 (1½x Dfl. 48 + 40x Dfl. 5). Thus total
cost for both methods are comparable, but with the aid of the computer
one information specialist can deal with 4 times more requests.**

Integration of on-line searching in established work patterns
Computer use started in Pudoc as an enclave, not really accepted by
the head of the department and other old hands. When I started with
the ALADIN project I was looked upon as some kind of 'wiz kid'. Even
when more people were employed who learnt how to use the computer
we were still referred to as 'the computer boys'. We did our own
marketing, and had our own group of clients. Integration is still
limited, as there is no well-established process of deciding who
should do what to which enquiry. We became convinced rather quickly
that the use of computer-readable files is just one tool in the large
toolkit of information specialists. However, theory is one thing,
practice another. Our special problem is the fact that the two main
computer search-formulators have only a professional training as
scientists but no formal training in information. They are still
waiting for it, but they cannot be missed from the job .... Both have
learned search formulating for computer retrieval on the job. Thus,
at the moment it depends on circumstances whether an incoming question
is handled in the traditional way or given to a computer search
specialist. The computer search specialists do occasionally consult
traditional information scientists to add to their results from
traditional sources, especially if a client wants a bibliography in-
cluding material dating back further than the computer-readable files
available. On the other hand, questions with which traditional infor-
mation scientists are confronted, are sometimes given to computer
search specialists but this is more the exception than the rule. The
speed with which a computer search can be performed is often very
attractive both to the client and to the information specialist and
has a big influence on the decision which information tool to use.
For the many clients who do not need an exhaustive search but are well
served with a list of between 20-200 titles, a computer search of
the most recent material is very attractive. On the other hand, im-
portant printed information sources and information from local special-
ists on the subject may be overlooked. These might have provided an

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** This result is similar to the one reported by S. Johnston & D. Gray
   in 1977, but their results are based on less extensive searching
   and much lower hourly rates for labour. In 1977, we used a total
   of 251 hours of computer connect-time, 178 of which were used to
   answer 252 requests; the rest was used for demonstrations, training
   and other internal needs. The main data bases used were AGRICOLA
   (28%), CAB (15%), Biosis (15%), and ChemAbs (13%). Now that we
   have just been allowed an extra staff member a further increase of
   on-line searching is expected. (See S.M. Johnston and D.E. Gray:
   Comparison of manual and online retrospective searching for agri-
   cultural subjects. Aslib Proceedings 29(7), July 1977, p. 253-258.)

even more efficient answer for the client. I hope that in the future questions will be distributed to information specialists according to their subject specialization and will be answered by this one person by using all relevant sources available. I also hope that there will be rather intensive informal contact between all information specialists about the questions in portfolio both with regard to search strategies and computer files, and any other relevant information sources.
Even though, in my view, information specialists in an organization like ours should primarily be subject specialists, it is very likely that each of them will develop an expertise in a specific information technique. Consequently, co-operation between the information specialists is required if a certain technique is needed by a subject specialist who has not specialized in that particular technique.
It is essential that the responsibility for answering a question remains with that person who is the subject specialist for that question.

Pricing at Pudoc

We have decided on a flat fee per enquiry, not depending on the amount of work or computer time needed. In this way, the client receives a bibliography at a price he knows in advance. If he is not satisfied, he can come back for more information which will be supplied for the same price as long as his request is reasonable. The fact that some enquiries can be answered very easily whereas a tremendous amount of work is necessary for others, is generally not caused by the client but by the structure of the information sources available and the knowledge of the information specialist. Thus in our opinion, the amount of our effort should not be reflected in the price. The present rate is Dfl. 250 per enquiry. Simple questions are answered free-of-charge, but for very complicated questions we may ask a higher price.

Document delivery

The use of many computer readable files has increased the number of references in our bibliographies that are not easily available. Even though the Agricultural Library at Wageningen is about the fifth largest agricultural library in the world, it has difficulties in fulfilling requests for exotic documents which are now requested more and more frequently. Whether a paid-for document delivery service should be set up to deal with these difficult cases, is under discussion.
It is wise to discuss with the client in advance how fast he needs the full documents, because if the only thing he can use is a few articles immediately, the search should be restricted to readily available documents. It is because of these special needs that documentation systems based on local collections only will continue to serve a purpose for quite some time to come.

Outlook

The difficult national economic situation also has its repercussions on Pudoc's activities. A further increase in the volume of our services is only possible if special funding is forthcoming, but this is not likely to happen. Of course we can make a good case for the necessity of more intensive use of information sources: the information

explosion needs special measures to cope with it and especially in times of scarcity one should use existing knowledge as intensively as possible in solving new problems before embarking on new research. However, others can generally defend their own budget requests with equal strength. To get funds transferred from research to information is even more difficult, even though the total amount of money needed for information is generally only a few percent of the total research budget.

The place where the information is financed is also of importance: at the moment it is our experience that information is spread more easily if it is financed from a central budget, rather than from budgets for individual research projects. However, the latter approach may give a better insight into the total project costs. Only when clients get hooked on information are they willing to pay for it themselves. However, researchers need retrospective searches rather infrequently, so that many people have to be convinced before one can rely and build on a sizeable group of converts. Therefore the near future will probably bring only slow but persistent growth to our services. Some consolidation may also be a good thing, because we have had little time to adapt our own organization to the vast possibilities that the computer era has brought us.

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