

ANU Library
Occasional Paper
Number 1

A study of costs of the inter~library loan system at the Australian National University

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with
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FOREWORD

A Note to the Reader of this Report

This Report has been written primarily for those who might be interested in carrying out a similar costing study. It includes, therefore, a much more detailed account of procedures than one might normally expect in a final report.

Anyone reading the Report for management information would find all they required in the Abstract (following page), the Results of the diary study, (page 37), and the Conclusion (page 59). They might also find it worthwhile to look at the Gross Costs Study (page 51).

ABSTRACT

The ANU Inter-Library Loan Costs Study comprised two parts:

1. A detailed study which made use of a modified daily diary technique;
2. A gross costs study which made use of personnel files and existing statistics to establish overall costs.

1. A modified diary procedure required all staff who were involved in any way with ILL work to fill in a diary form every day for two months. During the first month all requests entering the system for the first time (i.e. requests initiated during that month), whether incoming or outgoing, were numbered. The numbered requests constituted the sample of requests for this study. The number on each request and the work done on it were recorded on the diary sheet. The diary sheet was a record of times spent on various discrete tasks and in relation to a particular request.

In the first month this information was recorded for all requests, both ongoing requests and those initiated during the month (the numbered requests which constitute the sample).

In the second month diary sheets were filled in only in relation to the requests initiated during the first month (i.e. requests in the sample).

The aim of this diary procedure was to collect two separate groups of data,

- a. data about how much time library staff involved in ILL work spent in various tasks over an entire month, i.e. a detailed picture of the workload of the ILL system,
- b. data about a large sample of ILL requests which would show what tasks were done on each request, by whom and when, thus allowing for a study of the variability in processing time and costs of ILL requests.

The study succeeded in obtaining the first but not the second objective. The tail of the sample was lost and it was not possible to use the existing data to extrapolate this area.

2. The gross costs study is an independent and more reliable measure of annual costs. It does, however, rely on the diary study for estimates of time contributed by those outside the ILL Unit to the ILL system. Its estimates of costs per transaction are not independent, as a gross costs study cannot examine cost per unit time. It relies on the diary study for its cost ratios.

The results obtained by the two separate studies are similar.

1. INTRODUCTION

This study examines the cost entailed in operating an inter-library loan service within one university library. In itself it is a very limited study. It is concerned only to establish immediate, tangible costs. Yet studies of this kind are an important first step in the formulation of library policy in the area of inter-library loan.

The attention which is now being focused on inter-library loans (ILL) here at the Australian National University and in other university libraries, reflects a growing concern about the costliness of their operations. In an era of financial constraint any costly service for which demand is likely to increase deserves close scrutiny. If libraries continue to provide what is virtually a free service and if demand increases, other areas of library services will clearly suffer, unless additional funding is provided.

At present Australian university libraries shoulder an unequal portion of the inter-library burden. Their collections represent a major part of the country's total library resources. Yet there has been no recognition

here, as there has been in the United States¹, or Great Britain², of the importance of research collections as a national resource and the need for special funding to ensure that these are maintained and strengthened. It is not likely that any moves of this kind will be made in Australia in the immediate future nor is it likely that there will be a major reorganisation of the national inter-library loan system. What will come first will be the levying of a charge for a service which hitherto university libraries have provided free of charge.

A limited cost study alone will not resolve these questions. But we must start with costs for they lie at the heart of the issue. We need to know what the costs are before we can ask who should

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1. The US Congress has authorised the payment of special funds to research libraries to help develop their collections and to enable them to make their resources available to other libraries whose users need these research materials. This represents "the first piece of federal legislation and potential appropriation which will begin to implement the recommendations of the National Commission for a national program of resource sharing". John G. Lorenz, "The national bibliographic network: the view from the research library", Journal of Automation, 10(2), June 1977, 114-119.
 2. In the United Kingdom the British Library Lending Division acts as the library of first resort in the national inter-library lending system, but relies on other library collections, particularly university collections, as a back-up. Foremost among these are the Copyright Libraries of Oxford and Cambridge. These institutions are paid by the BLLD at an agreed rate for each loan or xerox they supply to the national system. Such funds can be used for the employment of extra staff to handle these ILL requests.

bear them and whether we can design and implement a system which is less costly and more efficient.

The results of this study contain no surprises. We had guessed roughly what our costs per transaction and gross annual costs would be. But guesses, even informed guesses, are not enough. A case for separate funding or a decision as to what charge to levy, both require an accurate estimate of the costs.

This, then, is the background to the ANU Library's decision to conduct a detailed analysis of its inter-library loan costs. Late in 1976 it was decided to investigate the various alternative procedures that could be employed in a study of the costs entailed in providing an ILL service. The final decisions about the method and timing of the study were taken in April 1977. The pilot study was conducted early in June and the main run in July and August 1977. The data was collected daily, checked for errors and missing information and then recorded on computer disc. Data recording and the editing of the computer record were completed by mid-November and the analysis by late December. This report was completed in February 1978.

The ANU Inter-Library Loan System

Any inter-library loan system is a complex affair. It must process two separate kinds of items - outgoing requests and incoming requests - which require different procedures. Each type may be satisfied in different forms - photocopy, original volume, thesis, microfilm or microfiche - which require different procedures. The different destinations for ILL material - local, interstate, overseas - may give rise to quite different procedures. While a certain series of tasks are performed in relation to each kind of request and while some of these may be routine tasks, there are frequent departures from routine and, for reasons other than pure efficiency, there are many extra things done. In a highly decentralised system such as the ANU Library, the ILL system is further complicated by the diffuse nature of the system, by the large number of staff who contribute at various points, and by the need for efficient internal communications and delivery systems.

The ANU Library comprises three main libraries and eight branch libraries - the R.G. Menzies Building contains research material in the Social Sciences and the Asian Studies collections, the J.B. Chifley Building comprises research material in the Humanities and Undergraduate collections, while the Life Sciences Library will increasingly serve the general Science community on campus. The branch libraries comprise: Astronomy, Chemistry, Earth Sciences, Geology, Law,

Medical Sciences, Physical Sciences and the North Australia Research Unit, Darwin. Three inter-library loan systems operate within this large, de-centralised library organisation - the main ILL system, the Law ILL system and the Asian Studies ILL system. The main ILL system handles all requests for science and social science and humanities material. Most science, social science and humanities material transactions pass through the ILL Unit and the Unit maintains records of all these transactions but the science libraries despatch directly most of the material they lend to outside libraries and also maintain some records. Verifying of outgoing requests is usually done by the libraries before the requests are passed on to the ILL Unit but as adequate reference tools are not available in each library, this is not always possible. The ILL Unit checks all requests going from the ANU to outside libraries and decides where they will be directed.

The costs study is a study only of the main ILL system. It is designed to give a picture of this complex, diffuse and variable system in operation. The design is, however, one which could be applied in any system whether more centralised or even further de-centralised. The more centralised a system the easier it is to establish the costs. Where all ILL work is performed by ILL staff within an ILL unit, costs may be readily ascertained. In such a situation, the second part of our study which involves the use of daily diaries may not be considered as essential as in a more diffuse system.

Limitations

- a. The study is primarily a study of costs. This kind of procedure should also, however, allow for a study of the time it takes for requests to pass through the system and the time required for actual processing. To the extent that it does it is a study of the time factor in the inter-library loan system.
- b. A study of costs is a study which attempts to measure the 'sum of money or equivalent expended in terms of labour, materials, use of equipment, rent, etc. to produce a product or service'. The cost of a service must, of course, be distinguished from the price which might be asked for the service and from the value of that service to the user.¹ It is not a cost benefit analysis. It does not involve a monetary assessment of total costs and revenues of a service and it does not attempt to attach a monetary measure to what are usually called 'social' costs and benefits. The costs examined are tangible costs. As it does not attempt to examine benefits it cannot be a cost-effectiveness study. It does not provide the kind of data that would permit an assessment of 'whether the same

1. JOHANNSEN, Hans and PAGE, G. Terry, International Dictionary of Management. A Practical Guide. Kogan Page, London, 1975.

expenditure could be used more effectively or whether the same benefits are attainable with less expenditure'.¹

- c. The study does not examine all the tangible costs involved in operating an ILL system. Two minor areas are ignored in this study. Delivery staff are not included and reshelving of ILL books is ignored. Both areas presented difficulties in isolating ILL material from other material. As these tasks go on whether or not ILL material is there and as ILL material is only a small proportion of material delivered or reshelved, it was thought better to ignore these areas than to complicate the costing procedure and increase the possibility of error.
- d. Other less tangible costs which would have formed an essential part of a cost benefit analysis are also ignored. There is no attempt to attach a cost to the delays experienced by users who must wait for material requested through the ILL system, nor the cost to the ANU of being deprived of material (it has purchased, processed and shelved) while it is on loan to other libraries. It is, in fact, a matter of contention as to whether or not there are real costs involved here.²

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1. JOHANNSEN, Hans and PAGE, G. Terry, International Dictionary of Management. A Practical Guide. Kogan Page, London, 1975.
 2. See the report by B. Houghton and C. Posser "A survey of the opinions of BLLD users in special libraries of the effects of non-immediate access to journals", ASLIB Proceedings, 26(9), September 1974, 354-66, and a report of a study at the University of Lancaster by M. Stuart, "Some effects on Library users of delays in supplying publications", ASLIB Proceedings, 29(1), January 1977, 35-45.

Certainly they would be very difficult to establish accurately.

- e. One other obvious limitation should be briefly stated as a reminder of the incomplete nature of many studies of this kind. A study of one ILL system on its own does not establish the full cost of providing an ILL service or of processing individual requests. It gives an estimate of the costs borne by one of the libraries involved in a wider system and, in the case of any one request, it is an estimate of only a portion of the cost of fulfilling that request, i.e. the cost to the ANU Library.

Rationale for this Study

- a. The overall rationale for the study has been the need to establish what proportion of the library budget is presently required to provide what is known to be an expensive service. Establishing the cost of the various services and functions of the library is considered an essential first step in effective financial management. No organisation should continue to provide year by year a service, especially one on which it seems likely increasing demands will be placed, without knowing what it costs to provide that service. Costs and cost increases must be continually assessed.
- b. The second reason for conducting a study of this kind is to establish a basis
 - (i) for determining what charge might be made to users of the ILL system

(ii) for arguing for separate funding of ILL services.

If charging is to be accepted or a proposal for separate funding drawn up, cost estimates based on a carefully conceived study of the ILL system must be established.

[As stated at the beginning of the Report, it is probable that charging for ILL services will come first, even though separate funding of a nation-wide system would be by far the most efficient and equitable system. Moves are already afoot to introduce a redeemable voucher system throughout Australia. The decision to charge other libraries and one's own patrons for ILL services would be taken most reluctantly. What so often happens when charges are implemented is that departments, not individual academics, bear the cost. The cost is simply passed from one area of the university to another. Inevitably those who can least afford the charges are the ones who end up paying from their own pocket - students and tutors.]

- c. A third concern is that in deciding whether or not to purchase documents and other items, especially highly specialised research literature, it is important for a library to know at what point it becomes more economic to borrow a document than to purchase, process and shelve it.

Study Guidelines

In the early planning stages of the costing study a number of guidelines were established. It was decided that any procedure devised for costing the main ILL system should have the following characteristics:

- a. It should be a simple, straightforward procedure,
 - (i) so that it can be applied by persons with no background in costing procedures;
 - (ii) so that it can be implemented by one individual working on his own or with a minimum of assistance;
 - (iii) because it must not itself become a costly exercise.
- b. Any sampling procedure adopted must be one that ensures reliable and valid results. Some previous costing studies have worked with too small a sample over too short a time period.
- c. It should be a general approach which can be applied in other settings and take into account the idiosyncratic features of different university libraries. Only if such a system can be developed will there be any possibility of comparing costs of ILL systems in different university settings.
- d. It must differentiate between outgoing and incoming requests and between fulfilled and unfulfilled requests.

- e. It should disrupt as little as possible the day-to-day functioning of the system and make few demands on those operating the system. It should rely wherever possible on statistics already collected and on existing files.
- f. The procedure should be one that throws some light not only on costs but on other features of the system - delays, inefficiencies, duplication - and allows for study of these alongside the study of costs.

Not all of these guidelines have been observed.

- a. In an effort to keep the procedures simple it was decided not to attempt to distinguish between fulfilled and unfulfilled requests. There were problems of definition as well. While it might be clear whether a lending (or incoming) request has been fulfilled or not, there are practical problems in deciding at what point a borrowing (or outgoing) request should be labelled unfulfilled.
- b. Part two of the costing procedure made considerable demands on the staff handling ILL requests. This was particularly so in the ILL Unit itself. Following the pilot study certain modifications were introduced in the design of the daily diary sheet used by all staff in the study, and in the procedures for recording work done on ILL requests. These modifications have made recording procedures less burdensome but they still require time and do constitute an interference in the system that is being observed.

Choice of method

A number of possible costing procedures were considered. Each could be used on its own or combined with other procedures. The alternatives considered were:

a. An overall estimate of gross costs

Estimates are made of hours spent on (and therefore salary costs related to) ILL operations together with the non-labour costs involved. Existing statistics are used to establish numbers of transactions.

This procedure on its own would give no detailed breakdown of costs and no information about time taken in each task, time necessary for a request to pass through the system or any picture of where delays, inefficiencies and duplications might occur. It would also need to rely on estimates provided by the staff themselves or supervisors, of time spend in ILL work. On its own, the procedure does not allow for a check on these estimates.

As one part of a study alongside a more detailed investigation, it provides an essential context for a costing study. It is the only method which examines all the fixed costs involved in operating an ILL system. (one can, of course, add an estimate of overhead costs, in the other procedures. But here overhead costs are seen in their proper context as part of a fixed annual commitment.) It is the best method for establishing the overall cost of running an ILL system and for

establishing what proportion of the library budget is devoted to providing that service.

b. A diary method

All staff who play any part at all in the processing of ILL requests complete a daily diary sheet indicating the number of minutes spent on various ILL tasks. The procedure is rather burdensome to employees and is considered rather inaccurate. Whether the inaccuracy would be in the direction of overstating or understating costs would depend on the whole purpose of the study as perceived by the participants.

The procedure in its conventional form does not give a picture of the system in operation, of how requests proceed through the system, how much time is spent on each request and how long the process from start to finish takes. It does not allow for the identification of different kinds of requests, nor for recording such information as where requests have come from and in what form they are satisfied. It does give a picture of duplication, delays and inefficiencies.

The diary method's advantage is that it is an excellent means of establishing workload distribution, of finding out who does what and for how much of their time. It also allows for the examination of unproductive time which, in an ILL study, means all time not spent in actually processing requests.

c. Work sampling method

This may be carried out in a number of different ways. The alternatives considered were random time sampling by outside observers or with self-observation. The working time of all appropriate personnel is sampled using a structured check-list of mutually exclusive tasks. The workers' actual wage rates are applied to the resulting percentages. Material costs, fringe benefits and overhead are calculated separately.

The appeal of this method is that it causes minimal interference with service operations and does not distort the data being collected. Acceptable reliability can be achieved at low costs. However, it does not seem as relevant here at the ANU as it would in a more centralised context and it was felt that using an observer to check at random times or using alarm devices for self-observation would not be acceptable to the staff involved.

d. Sampling and monitoring of requests

A sample of both incoming and outgoing requests is monitored by attaching a log sheet to each sampled request. On this is noted the estimated time spent by each employee in processing that request. A random sample of a certain size may be taken or a sample of all requests occurring over a selected period of time, eg. one month.

This method has high reliability and has the advantage of giving detailed information about the system and a breakdown of costs,

revealing areas of greatest cost or inefficiency. Its disadvantages are twofold. It is, itself, an interference in the system it seeks to measure and requires more time and effort on the part of employees than some other costing methods. If a method makes too many demands on ILL staff time it will distort the costs it seeks to establish. Secondly, it fails to take account of major cost components such as unproductive time which might be defined as all time in which staff in the ILL Unit are not directly engaged in processing ILL requests - supervisory tasks, compiling statistics, etc.

The final decision was to employ two procedures - the gross costs exercise and daily diary method. The gross costs study is seen as supplementing the more detailed study. The diary method adopted is a modified diary procedure which records time spent on each request and so allows for the construction of a log of each sampled request. It thus incorporates the virtues of the diary procedure and the logging-of-requests procedure. We have not, of course, been able to retain all the detail that a logging procedure as outlined above would have provided but have been able to develop a much more useful picture of the ILL system than a conventional diary method would allow.

By employing two measures of costs we have been able to check the estimates provided by each procedure. The diary method has provided a more accurate measure of the proportion of time spent on ILL requests by staff

outside the ILL unit than might have been obtained by asking these staff or their supervisors for an estimate of this time. This has ensured that the gross costs study is more reliable.

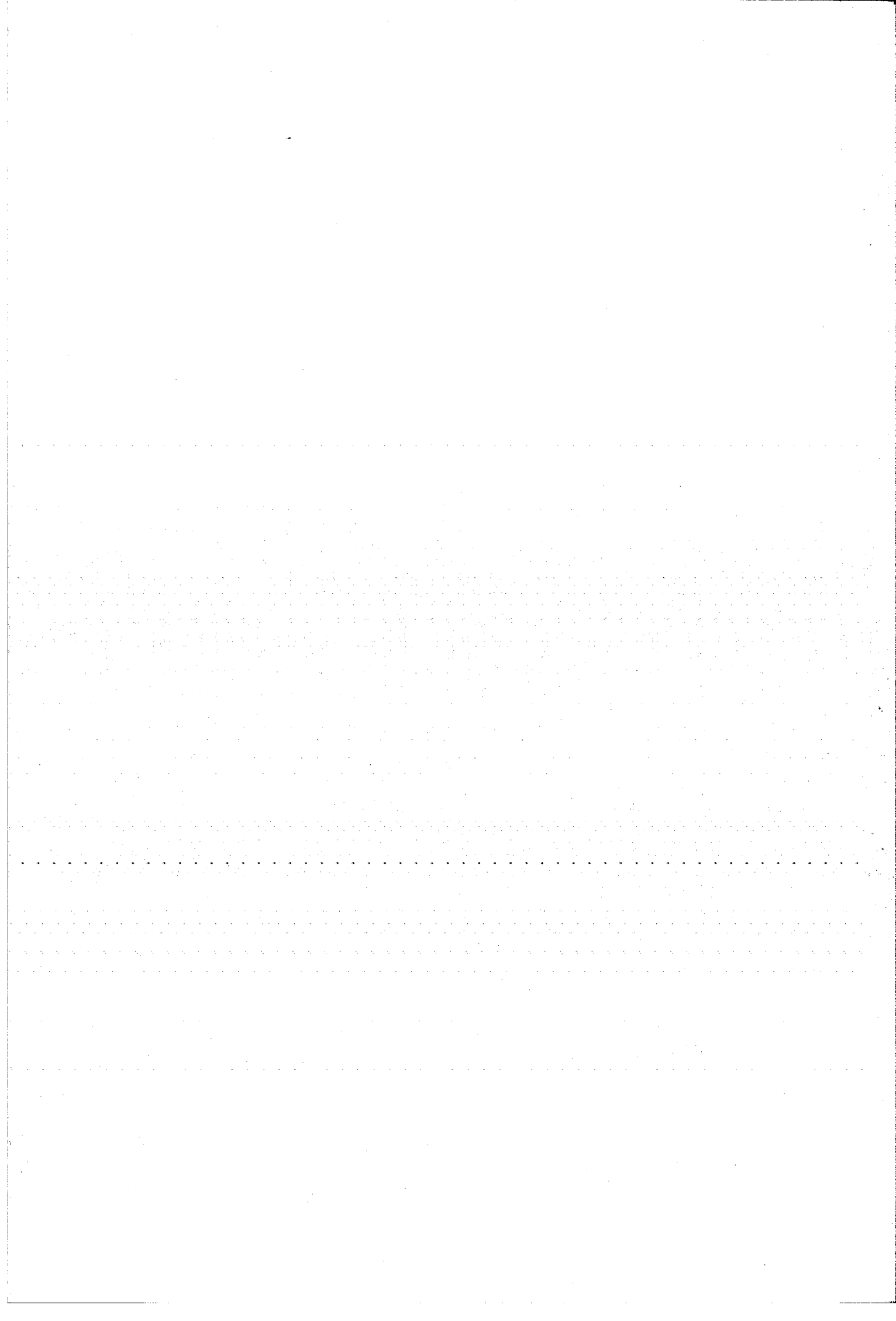
A two-tiered study: summary

As was stated earlier, the costs study consisted of two parts. The first is a study at the most general level, a study of gross costs. It is a study of the system as though it were a unit with certain readily specified costs. It is this study which will give the clearest picture of the overall cost to the Library of providing an ILL system and provide the most convincing grounds if it is decided to put forward a case for separate funding.

The second part of the costs study is the detailed study of the system in operation. It has been designed to give a breakdown of costs, by task, by staff member or category of staff and by location, and to allow for a clearer more detailed picture of the cost per transaction¹ than could be achieved through a gross costs analysis. It will also permit some analysis of the time component - time per task, proportion

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1. We have distinguished between the cost per fulfilled transaction and the cost per item processed. The former would be the charge levied on all satisfied requests such that the costs involved in handling all requests are covered by the charge. The latter is a processing cost, what it actually costs, on average, to process borrowing or lending requests.

of overall processing of time spent on certain tasks, time contributed to the ILL system by each staff member and by different groups of staff, time during which material on loan to other libraries is not available to ANU borrowers and so on.



II MODIFIED DAILY DIARY STUDY

The choice of the diary method was not a clear cut issue. Once it was decided that a gross costs study was an essential component of the overall design, it was a matter of deciding which of the more detailed methods would give the additional information sought and give a satisfactory level of reliability. Two alternatives were now considered - the logging of requests through the system and a daily diary method.

The view of the sociologist was that a logging procedure would give us a much clearer picture of the system in operation and would permit us to record a considerable amount of detail about each request - where it came from, where it was directed, in what form it was satisfied, etc. Provided the sampling procedure allowed for reasonable spacing of the requests to be logged, the method should not interfere unduly with the system it sought to measure.

The view of the Library's accountant was that while a logging procedure might be more appropriate for a general study of an ILL system it was not a reliable costing approach. Its primary defect is that it does not take account of unproductive time or allow for its measurement. The accountant's definition of unproductive time in this system was any time not directly involved with the processing of ILL requests - that is, compiling statistics,

administrative and supervisory tasks, idle time and so on. To speak of unproductive time in the ILL system is clearly meaningful only in the ILL Unit itself. If, eg. staff elsewhere in the system, apart from the ILL Unit, are idle for periods of time, their idle time should be considered a cost against other library services and functions. A logging method, tied as it is to actual requests and the work done on them, does not take account of unproductive time as defined.

As our primary objective was a study of the costs of operating an ILL system and as other aspects were of a lesser concern at the time, it was decided to accept the accountant's position. A compromise was achieved, however, and the diary procedure modified to allow for the recording of times and tasks in relation to a particular request. A conventional diary method would provide only information about time spent in particular tasks by particular staff.

The modified diary procedure has meant that we have been able to construct a log of all requests in our sample. All requests, both outgoing and incoming, initiated during the month of July, constituted our sample of requests. Each request was numbered at its point of entry into the ILL system.

Hence we have been able to incorporate some of the virtues of the logging study into our daily diary method. We have not, however, been able to collect the kind of detailed

information about particular requests that only a logging method provides for. Some of this information is available in the records of transactions which the ILL Unit maintains. A sample of these records going back over a fairly lengthy period of time would provide more useful information about the number of days taken to process requests than our costing study has yielded. Information about the different kinds of requests typically handled by the Unit and the form in which they are satisfied could also be gleaned from a study of records. The statistics which the Unit already provides do in fact give some initial breakdown of the different kinds of requests.

The numbering of requests

The diary forms were used to collect information about the work done on each request passing through the system. Complete information about a particular request was only possible if we were able to keep track of the request from the moment it entered the system until the last piece of work was done on it. We therefore distinguished between requests initiated during the particular month surveyed and those that had been initiated prior to that month and were still in the system. Requests initiated in the month of July, both borrowing and lending, were numbered and constituted the sample of requests for this

study¹.

The Library computer was used to print a sequence of numbers on sticky labels. These were used to number the requests at their point of entry to the system. The first series was in red for borrowing, the second in black for lending. All service points in the Library were issued with a set of red numbers (and a smaller number of black for requests telephoned directly to a particular branch library). The greater proportion of black numbers was used by the ILL Unit to number incoming requests. A smaller batch of black numbers was used by the Life Sciences Library for numbering the requests with which they dealt directly. The numbers were printed as a four digit number followed by a check digit (modulo 11). The check digit proved invaluable in editing the computer record of the data. The number identifying each of the requests in the sample had to be written by hand on all further forms relating to that request. A green, fine felt-tipped

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1. There was no difficulty in defining a lending (or incoming) request initiated during July. Any request from an outside library for material on inter-library loan was included in the sample, whether it was fulfilled or unfulfilled. Borrowing (or outgoing) requests were more problematic. Many requests submitted as ILL requests are satisfied within the ANU system. A borrowing request was therefore defined as any request made on the large white form which ANU patrons fill out when they think they require an inter-library loan. The red numbers on sticky labels (which numbered the requests in the borrowing sample) were attached to this same white form. Even if it took only one minute to establish that the item was in the catalogue and one minute to inform the user of the fact, these times should have been noted on the diary form against the number of the request.

pen was used to write the number in the upper right hand corner of a form to avoid confusion with telephone numbers, etc. Staff were reminded to begin numbering from the first day of the month of July and to cease numbering on the first day of August.

To ensure that complete information was obtained about the requests in the sample, numbered requests that were not yet completed at the end of the first month were followed through the system for a second month. This meant that while in the first month diary sheets were filled out in relation to all requests, numbered and ongoing, in the second month only work done on the numbered requests still in the system was recorded.

It was hoped that sufficient information would be obtained to provide estimates of the time involved in the various tasks that would be necessary to complete those requests that were incomplete or unresolved at the end of the second month.

The numbers were distributed in batches to the various service points and the ILL Unit. A record was kept of which red numbers (borrowing sample) particular branches were using. We did not however, provide for any breakdown in the black numbers that would have indicated, eg. from which outside library a request had originated or even whether it was a local or interstate request. Had we done so we might have been able to do a more refined and useful analysis of lending requests.

and in relation to particular requests. In the usual diary study staff are required to record only the time they spend on various tasks, the items processed are not specified. Our aim was to compile a log of each request and to use this information to examine processing time and time in system and to examine duplication, delays and inefficiencies.

The need to simplify the procedures whereby staff recorded their ILL work meant that a certain amount of detail about particular requests was lost. Most of this was of no consequence but information about precisely when a request first left the ANU system would have permitted a much more complete analysis of processing time (days taken to respond to a request) than we have been able to provide. However, as pointed out earlier in the Report, if such data is required it could be obtained from existing records in the ILL Unit.

In examining duplication of work, delays and inefficiencies, this particular procedure has not proved an ideal instrument. The need to keep the number of discrete task categories manageable has meant that each category covers a number of separate activities (see Appendix I). For example, it seemed quite logical for the verifying category to include all the following activities:

- (i) establishing that an item is or is not available within the ANU Library system;

- (ii) establishing in which library(ies) the item is located;
- (iii) establishing the correct citation of requests in order to refer it to another library;
- (iv) the "quality control" functions exercised by the ILL Unit;
- (v) deciding where to direct the request.

Each of these activities might be performed at different times by different people but all would be recorded as "verifying" in the log of any particular request. We could not, therefore, conclude that numerous "verifying"s meant that work was being unnecessarily duplicated. Again it was a question of sacrificing some detail for over-all simplicity of design. If the form has too many categories and the procedures for filling in the forms are too cumbersome and time-consuming, the likelihood of error is greatly increased.

Despite these limitations, the modified diary procedure has proved most valuable. The additional information collected has allowed for a breakdown of times and costs and has given a much more detailed picture of the costs per transaction than we would have obtained from the more generalised diary study.

The diary form had also to take account of the fact that not all tasks are associated with the processing of a particular request. The columns on the far right of the form were reserved for these tasks. In effect, they help give a more detailed picture of what might

otherwise have been lumped together as unproductive time.

Procedure

The daily diary study required all staff involved in any way with the processing of ILL requests to complete a daily diary sheet every day over a period of two months (July and August). Staff in the ILL Unit, Reference Staff, Circulation Desk staff and all staff in branch libraries took part in the study. All ILL work done by these staff was recorded on a daily diary sheet. During the first month staff were required to record time spent in various tasks in relation to all requests, both ongoing requests (requests already in the system at the beginning of July) and those initiated during that month. Those ILL transactions initiated during this first month were numbered and constituted the sample of ILL transactions for this study.

In the second month staff were asked to record only ILL work done on numbered requests, i.e. requests in the sample.

Two meetings of the staff involved in the study were held, one prior to the pilot run and one before the main run. Staff who could not attend the meeting were seen individually. All procedures were explained in detail.

The costing procedure required staff to record time spent in discrete tasks for individually numbered ILL requests (and, for the first month, on on-going ILL requests as well). The most

important aspects of this costing procedure were: -

- (i) The numbering of each request in the sample and ensuring that the number was written on all forms that relate to the particular request. (See section above (on page 21) entitled the numbering of requests.
- (ii) The usual procedure for filling out the diary sheet. In the first column the number of the request or "O/G" (to designate on-going or unnumbered) was written, then in the second column the time of starting, in the third column the finishing time or a duration time and then a tick in the appropriate task column. If more than one task was done simultaneously, two columns were ticked. If the task completed all further work on that request the "request complete" column was also ticked.
- (iii) Giving a batch start and finish time
If requests were handled as a batch then all the ILL numbers were written in column one as well as the number of on-going items (20 x O/G), but in the second and third columns a single start and finish (or duration) time was recorded. The task columns was ticked. (It must be the same task for all items in the batch).

(iv) Bulk processing

In certain specific circumstances, requests were processed in bulk with no differentiation between numbered and unnumbered requests. In column one the number of items being processed was noted, a single start and finish (or duration) time given in column two or three and then a tick in the appropriate task column(s). This modification was introduced after the pilot run when it became clear that there were times when it was taking more time to list all the numbers and ongoing items than to complete the actual tasks. This was particularly so in the ILL Unit itself. Either or both of two conditions must apply before the bulk processing provision could be used.

- (i) When the time taken to process the requests in bulk warranted recording but the time per request was negligible (e.g. the greater part of routine "record keeping").
- (ii) When the task involved handling requests in bulk before they could be identified as separate items. (e.g. checking the numbers on certified mail, unpacking books, opening mail).

Bulk processing was not to be applied where the time for processing each item varied considerably or where the time per item was more than approximately

two minutes (e.g. verifying, photocopying, locating material on the shelves, communicating with the user. These could be given a batch time but were not to be made a bulk process).

There was one important caveat to the bulk processing provision. It was essential to know when a request entered the system and when it was completed. Items entering the system had to be numbered immediately and the numbers listed on the diary sheet with the first task undertaken. As requests were completed the record keeping tasks associated with the completing of each request had to be set out so that we knew at what point in time a request was completed (as far as the staff member was aware). As was pointed out above we did not allow for specifying the point at which each numbered item first left the ANU system and so were not able to analyze the time it takes the ANU system to respond to a request (either incoming or outgoing).

- (v) Recording work which is not concerned with the actual processing of requests. The first column was left blank, the times were given in the usual way in columns two and three and the appropriate column on the far right of the form was ticked. During the pilot run staff in the ILL Unit were inclined to tick the "other" column on the extreme right of the form

to indicate any time which might be labelled unproductive - tea breaks, conversations with the researcher, trips to the toilet, etc. Staff were reassured that unproductive time of this kind was taken into account in any assessment of costs and there was no need to be concerned to account for every minute.

- (vi) If no ILL work was done on a particular day. Staff were asked to complete a form for each day regardless of whether or not any ILL work was done. If a staff member was ill or on recreation or special leave or taking "flex-time" leave, he or she noted this on their form. All leave categories were separately coded. During the second month, forms were completed and despatched to the R & D Unit only if ILL work had been done, (i.e. work on the numbered requests in our sample.)

The pilot run

The pilot run took place from Monday 30th May until Friday 3rd June, 1977. Diary forms and sticky numbers were distributed during the week before the trial. In retrospect it is clear that five days was not sufficient for a trial run. While the five day trial was a quite adequate test of the actual procedures for numbering requests and of the diary form itself it did not allow the gathering of sufficient data for any useful analysis. Had we had sufficient data to proceed with analysis we might have decided to ensure that some more

Pictured below is the form used in the pilot run.

CP-569-77

The major criticisms of the first diary form were -

- (i) that the distinction between "loaning process" and "record keeping" was a confusing one;
- (ii) that some "out-of-the-ordinary" things done to particular requests could not fit happily in any of the existing task categories;
- (iii) that the ordering of the columns was confusing and that the lining-up of columns and task labels was difficult for those with particular sight defects.

The pilot run diary form was modified and judged much easier to use in the main run.

Data recording

Staff were asked to ensure that diary sheets were despatched to the R and D Unit each day. Not all remembered to do so but most complied. It was important that all checking of the diary forms be done as soon as possible after the day to which they referred. If information is missing or times overlap, then it is much more likely that a person will recall what they were doing if it is only yesterday, rather than several days ago. All diary forms were checked immediately and were given name and location codes. Data was typed in at a visual display terminal and recorded on disc in the Library's Interdata 8/32 computer. The data input program had built-in checks that helped ensure a high level of accuracy at the data recording stage.

All inconsistencies in the data that could not be resolved at this stage were noted and coded at the time of input. An editing process provided for correction of the data making use of this code for quick entry to the file. The data had also been reconstructed or relisted as a log of each numbered request. This print-out was referred to constantly in the editing of the data file. The amount of data was considerable - 23,538 records and 1,922 transactions in the sample. It was considered that sample size was sufficient to compensate for any error, although just how high the error rate is would be impossible to assess. As ILL requests are so variable, what might look in the log printout as distinctly odd and difficult to explain may in fact be perfectly correct. Most log records were left in the file. The few that were clearly in error were deleted.

Analysis

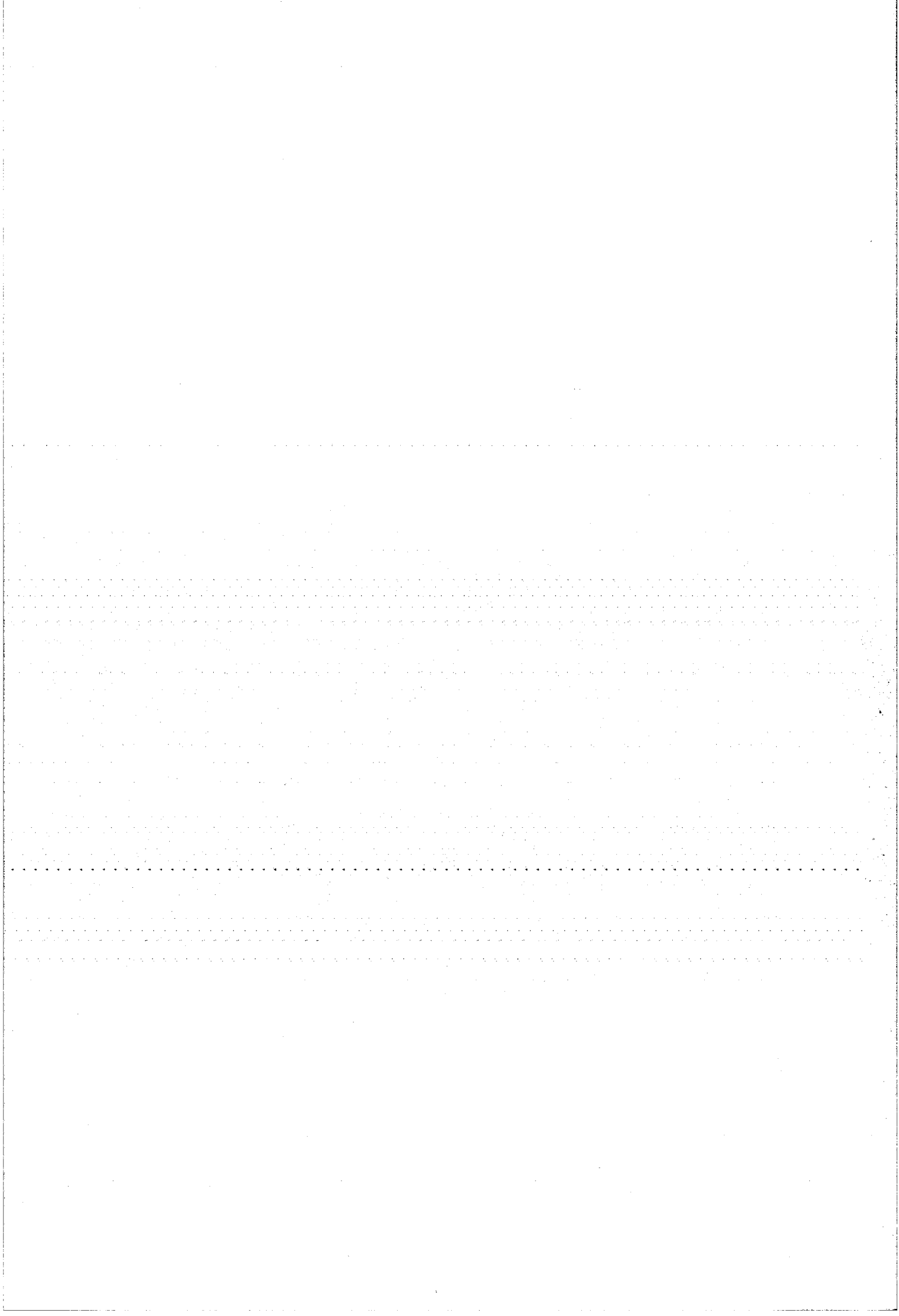
The total annual cost to the Library of employing each staff member in the ILL system and the hourly rate for each person were calculated by taking salary costs together with a percentage loading to cover the salary-related costs (superannuation, pay-roll tax and worker compensation). This information was added to the computer file in the form of a cost per minute for each staff member. Thus each record in the file was now assigned a cost estimate. The computer record was subdivided into four separate files -

- a) all data concerning tasks not directly associated with the processing of requests;

- b) all data concerned with ongoing requests;
- c) all data concerned with incoming requests (the lending system);
- d) all data concerned with outgoing requests (the borrowing system).

Files c) and d) were subdivided into July data, August data and combined data. Any analysis could now be related to a specific sub-file and to specific information in that sub-file.

Cost analyses were concerned with the salary costs for the ongoing requests and for borrowing and lending requests in the sample, unproductive and supervisory costs, costs for the different kinds of requests, individual staff costs and their contribution to the overall system. Time analyses were more restricted than we had hoped due to the loss of the tail of much of our sample data. The requirement that staff specify when a request is completed proved much more difficult than anticipated. (See p.37 and Appendix II) There seemed little point in trying to arrive at estimates of the remaining processing times and costs on incomplete requests as we had intended doing. Most time estimates had to be based on the data for July, the only month for which we had complete information. We were concerned with the amount of time involved in ILL work and what this represented in terms of numbers of staff. We were able to look at the work-load of the ILL Unit and of the various branches of a highly de-centralised library system. We were also able to make estimates of the "in-system" time for the two kinds of requests.



III RESULTS

The ANU Inter-Library Loan Costs Study has two major deficiencies which should be taken into account in the interpretation of results and which would require the re-designing of the study if it is implemented elsewhere. (These particular deficiencies do not apply to the gross costs study.)

1. Because we did not realise how high a proportion of ongoing material in the system at any time had been initiated more than a month before, the sampling period was not sufficiently long. This would not have mattered quite so much if we had collected information about all ILL work in the second month as well as the first. Having complete information for two months would have allowed for more accurate estimates and a check on some of the assumptions we have had to make. The reason staff were not required to continue recording all ILL work for a second month was a desire to lighten the load particularly in the ILL Unit where the study created considerable strains.
2. We had not anticipated the problems involved in requiring that staff designate when a request was complete. Staff had been instructed to tick the "request complete" column when, as far

as they could tell, the ANU would not be required to do any further work on that particular request. It was of little concern that certain requests were marked complete twice on the same day or the next but when we found two or more "completes" more than a week apart, we were left wondering how reliable a designation it had been. Appendix II shows the numbers of requests in the borrowing, lending and combined sample which could be described as complete (dark area), uncertain (grey area) and definitely incomplete (single line). These three graphs illustrate the difficulties experienced in making any use of the "request complete" designation.

If the study, which we believe to be basically of sound design and also very revealing and useful, is to be applied again, it should ideally record all ILL work for the first month and then follow the sample through the system for at least two more months, preferably three, even four. At the end of this period, the number of outstanding requests in the sample should be counted and a period of time, for example, two months, be added to their "in-system" time and an estimate of remaining costs added to the costs they have already entailed. Staff should be instructed to indicate when a transaction is completed. In a more centralised system this should be a more reliable procedure than in the diffuse ANU system.

Because of the shortness of the sample period in this study, the following assumptions about the ILL system and its workload have been made:

- a) that the amount of ongoing work in the system does not vary greatly from month to month;
- b) that the number of requests initiated in any one month is roughly equivalent to the number completed;
- c) that the proportion of borrowing to lending transactions among the ongoing requests is in the same ratio as borrowing to lending in the sample;
- d) that, as the ILL Unit represents more than 70% of the work load of the ILL system and the costs of the Unit do not vary markedly (apart from salary increases), the cost month by month for the entire system will vary only slightly.
- e) that after an examination of miscellaneous costs associated with running the ILL service, a loading of 20 per cent of salary costs would be an adequate recovery rate. Costs to be recovered include external telephone calls, telex charges, packaging materials, stationery, and photocopy charges.

That there is no great build-up of work from one month to the next and no real backlog, suggests that the above assumptions are reasonable. Some of these assumptions would be part of any investigation of ILL costs, even one more satisfactorily mounted than the present study.

Time and Costs for July 1977

Table 1 presents the times (in minutes) and costs for each segment of ILL work for the month of July 1977. Unproductive time includes all times noted on the diary forms as having been spent in tasks not directly related to the processing of requests. Only ILL staff are included here as unproductive time elsewhere in the system should be seen as a cost which is borne by other library services and functions.

TABLE 1 (see following page)

TABLE 1

Total times (in minutes) and costs of ILL System, July 1977

	NON-ILL				ILL UNIT ONLY				Unproductive & Administrative		TOTALS FOR ILL UNIT ONLY	TOTALS FOR ENTIRE ILL SYS- TEM
	Borrow- ing	Lend- ing	Ongoing	TOTAL	Borrow- ing	Lend- ing	Ongoing	TOTAL	ILL UNIT	NON ILL		
TIME (Mins.)	5650	4910	3672	18732	9011	11904	27512	48427	3542	-	51969	70701
COSTS (\$)	639.77	843.14	331.27	1814.18	871.79	1108.59	2435.73	4416.11	601.19	-	5017.30	6831.48

The ILL Unit represents 73.44% of the costs and 73.51% of the time of the entire ILL system. For the month of July, time recorded by the ILL Unit was 51969 minutes or 866.15 hours. This is the equivalent of 5.89 staff. The whole system accounted for 70701 minutes or 1178.33 hours which is the equivalent of 8.02 staff.

Total cost for July is \$6831. This suggests a projected cost for 1977 of \$81978 (approximately) which with the addition of a 20% loading to cover all overheads, gives a final figure of \$98375 (approximately) annual cost. Salary related costs were built into all calculations in the diary study. If we accept the figures that the gross costs study presents for salary related costs and the proportion they represent of salary costs and base our 20% loading for overhead costs on salary only figures, our final figure would be closer to \$96,500.

Cost per Item

The average cost per item was calculated by dividing the total July costs by the total number of requests initiated in the month of July.

If it is reasonable to assume that the cost of an item should be based on the number of products completed at the end of a given period (for which the costs are known), and if one assumes that the number initiated in this period is equivalent to the number completed (or otherwise there would be a build-up of requests from one time period to the next), then our cost per

item figures are valid estimates.

Table 2 gives the total costs for July and for the borrowing and lending systems and the cost per item.

TABLE 2

Cost per item based on July 1977 figures

	All Costs for July (ongoing and sample) \$	Number of Requests initiated in July	Cost Per Item (with 20% overhead) \$
BORROWING (outgoing)	2653.51	573	5.56
LENDING (incoming)	4182.43	1349	3.72
TOTAL*	6835.94	1922	4.27

* The slight discrepancies between totals in tables 1 and 2 are due to rounding-off factors.

Table 3 gives estimates of the cost per fulfilled transaction. This provides a direct comparison with the transaction costs provided by the gross costs study (Part IV, p.55). In this table the 20% loading to cover overhead costs is based on salary only figures (estimated) and the number of requests given is the estimated number of completed requests in July (based on the percentages for the entire year).

TABLE 3

Cost per fulfilled transaction based on July 1977 figures

	<u>All costs for July with 20% loading on salary only costs</u> \$	<u>Estimate of the number of fulfilled transactions in July</u>	<u>Cost per fulfilled transaction</u> \$
BORROWING (outgoing)	3109.70	418	7.43
LENDING (incoming)	4919.04	931	5.28
TOTAL	8039.27	1349	5.96

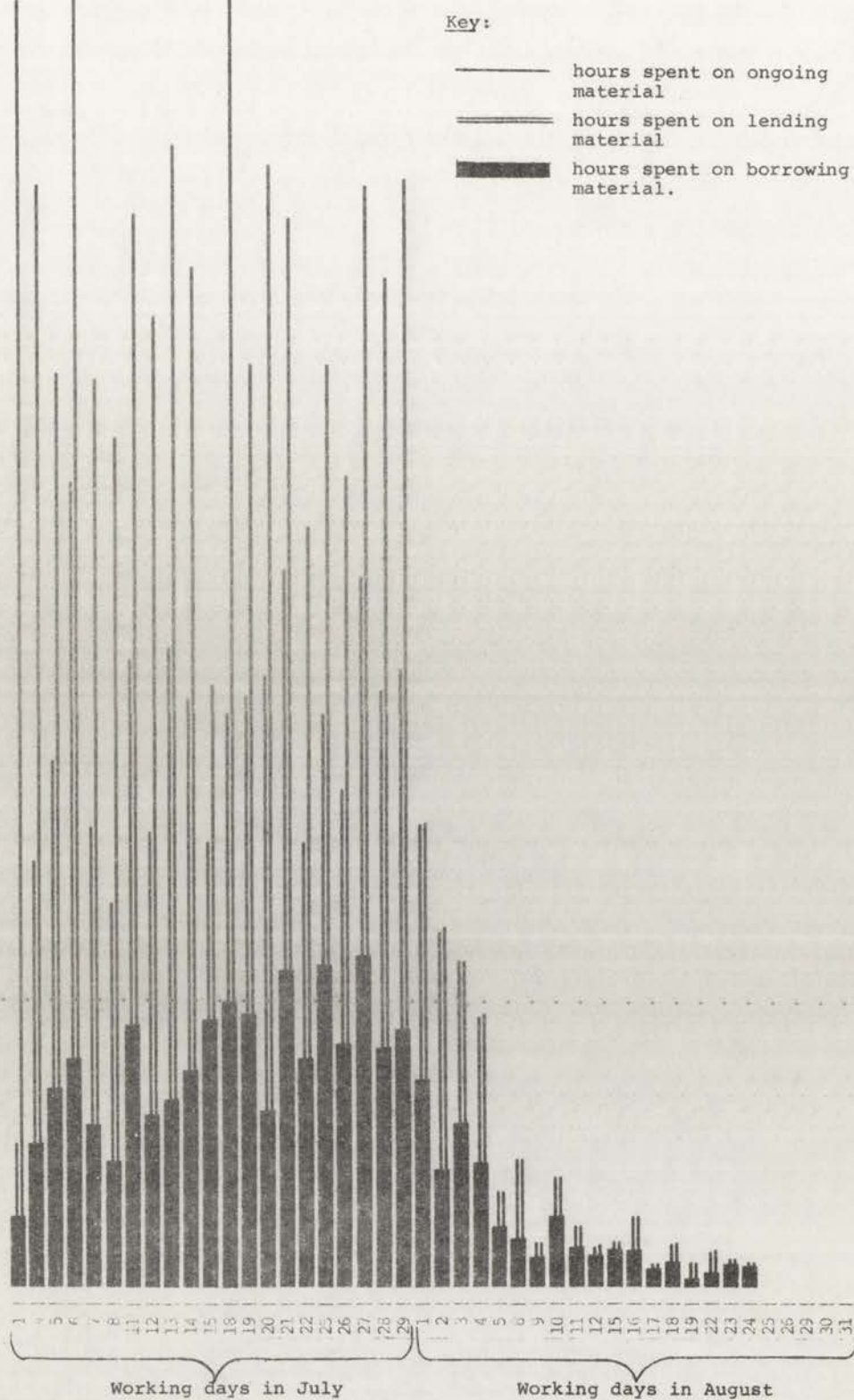
Work Load During July

The following graphs depict the hours spent in ILL work on borrowing (thick line) and lending (parallel lines) requests in the sample and on ongoing requests (single line) each working day of July 1977, and of hours spent in processing the sample borrowing and lending requests still in the system during August. The first graph represents time spent in ILL work throughout the Library, that is, the day-by-day work-load of the entire ILL system. The second graph presents the day-by-day work load of the ILL Unit. The days which stand out as representing an un-
characteristically large amount of time spent in ILL work are due to a number of people working longer hours to accumulate "flex-time"¹ on those

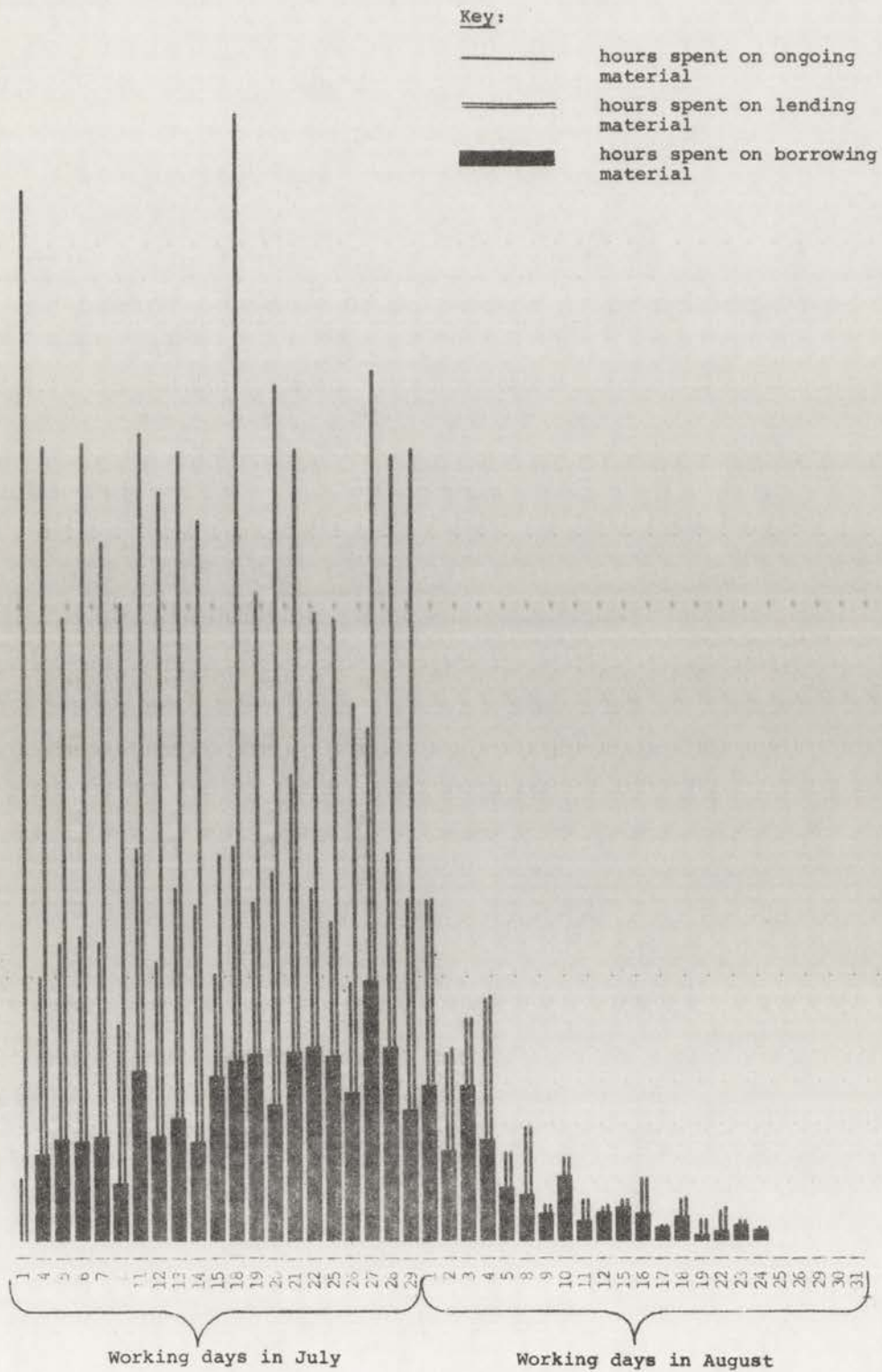
1. This is a system of staggered or flexible hours of working for non-academic staff at the ANU. Core time is from 10 am to 4 pm. Outside this time (8am to 10am and from 4pm to 6pm) is variable time. The accounting period is four working weeks i.e., 140 hours for 35 hour week staff.

days. All full-time staff in the ILL Unit (i.e. 5 staff) are on "flex-time" as are a few others elsewhere in the system. Reference staff, staff at circulation desks and branch library staff do not have "flex-time" arrangements. Some staff work in shifts, e.g. attendants in the Chifley Building. Low figures for a particular day are due to staff taking sick leave, recreation leave and "flex-leave".

GRAPH NO.1. Day-by-day workload of entire ILL system -
 July and August 1977.
 (August - ongoing material not shown)



GRAPH NO.2 Day-by-day workload of ILL Unit - July and August 1977.
(August - ongoing material not shown)



Time-in-System

Estimates of time-in-system are less reliable than other estimates but our figure for the average number of working days in-system for all requests, whether lending or borrowing, is about 25 days. This time includes, of course, the time during which an item is on loan to the ANU or an ANU item is on loan to an outside library. There is strong evidence that a true distribution of time-in-system values would have a relatively large number of extreme values on the right of the distribution with some requests remaining unresolved for an indefinite period. At the time of analysis (4½ months after July) eighteen requests from the sample remain in the system.

With minor adjustments to the costing procedure we adopted and with a longer sampling period, a measure of time-in-system and other measures of the time component would be much more reliable. A measure of actual processing time, that is from the time of entry to the point of first despatch, is of particular interest but, as mentioned earlier, our provision for "bulk processing" of items precluded any possibility of measuring this interval.

General Comments

Despite the deficiencies in the diary study, we can state with a high degree of confidence that, the results, particularly those relating to costs, are within 10% of the real cost.

To reiterate, the major findings of the diary study are:

- (i) Total cost for July - \$6831.
- (ii) Project annual cost - \$96,500 to \$98,000 - in other words about \$100,000.
- (iii) Cost per item or processing cost:
 - borrowing - \$5.56
 - lending - \$3.72
 - Average over both systems:
 - \$4.27.
- (iv) Cost per fulfilled transaction:
 - borrowing - \$7.43
 - lending - \$5.28
 - average - \$5.96.

In the next section of the report the results obtained in the gross costs study are presented. While they do not differ markedly from the results of the diary study there are minor discrepancies which should be noted. A gross costs study should be more reliable in its estimate of the total cost per annum for the entire system than a study which is based on only one month's costs. When it is remembered that July is not a month when recreation leave is high, and that, during the study, sick leave was particularly low, one would expect a lower annual cost from the diary study.

As will become apparent in reading the next section, the gross cost study's transaction costs (i.e. the cost of a fulfilled transaction), rely on ratios obtained from the diary study and to this extent these are not independent measures of transaction costs. The reader should also note that the gross costs study does not provide a cost for the processing of individual items.

In comparing the results from the two studies, it should be remembered that in the gross costs study, the 20% loading to cover overhead costs was based on salary only costs whereas, in the diary study (with the exception of Table 3 on page 44), the 20% loading is based on salary plus salary related costs. The former is the preferred approach.

IV GROSS COSTS EXERCISE

Introduction

This exercise is designed to supplement the detailed cost analysis and to permit the continuous monitoring, if necessary, of the ILL service cost at ANU.

Assessment of costs in this fashion is totally dependent upon knowing the total number of staff participating in ILL work throughout the ANU Library system and their salary levels.

It also assumes that the total number of requests processed and fulfilled is relatively static.

Compilation of Costs

Salary Costs

The detailed survey conducted during July/August 1977 showed that some 8.0 members of staff were involved in the survey of which the ILL unit accounts for 5.7 persons.

The classification and salary in the ILL unit are known, examination of the remaining 2.3 staff by reference to computer logs showed that there were 1.6 professional staff generally classified at the Librarian I level with the remainder being clerks. Using this base, annual salary costs for the ILL service can be estimated with some degree of accuracy as shown in Table 4.

TABLE 4

ILL service - annual salary costs (as at 30 June 1977 prices)

<u>ILL UNIT</u>	<u>\$</u>
1 x Librarian I	11,060
1 x Clerk IV	10,316
2 x Clerk II	17,744
1 x Clerk I	7,571
0.7 x Casual Typist	5,875
<u>Other Staff</u>	
1.6 Librarian I	17,696
0.7 Clerk II	6,210
	<u>76,472</u>

Salary related costs

Salary related costs can be expensive and are often overlooked when assessing costs. These expenses include payroll tax, workmen's compensation, and superannuation contributions for eligible employees. They are a real cash cost and should be added to salary expenditure when assessing total staff costs.

These costs are a fixed percentage of total salaries paid for payroll tax and workmen's compensation.

These percentages and annual costs at 30 June 1977 prices are -

- (i) payroll tax: 5 per cent of total salaries paid = \$3,824.

- (ii) Workmens Compensation: 0.32 per cent of
total salaries paid = \$245.

The employers share of superannuation contributions can be identified for each member within the ILL Unit. Costs for other staff participating in the ILL service are based upon the rate of contributions to the University Superannuation reserve.

Costs of superannuation for the ILL Service are shown in Table 5.

TABLE 5

Employers superannuation contribution⁽¹⁾
(as at 30 June 1977 prices)

<u>ILL Unit</u>	\$
1 x Librarian I	Nil ⁽²⁾
1 x Clerk IV	Nil ⁽³⁾
2 x Clerk II	Nil ⁽³⁾
1 x Clerk I	1,514
0.7 x Casual Typist	Nil ⁽¹⁾
<u>Other Staff</u>	
1.6 Librarian I	3,539
0.7 x Clerk II	1,242
	<u>6,295</u>

- (1) Any change in the number of people eligible to contribute to superannuation schemes, on the method of funding employer contributions to such schemes, may dramatically alter superannuation costs and subsequently the total cost of running an ILL service and cost per transaction.
- (2) Present employee not eligible.
- (3) Members of an unfunded scheme - liability met as it arises.

Total annual salary and salary related expenditure are shown in Table 6.

TABLE 6

Salaries		\$ 76,472
Salary related cost		
Payroll tax	3,824	
Workmens Compensation	245	
Superannuation	<u>6,295</u>	
		10,364
		<u>86,836</u>

Overheads

Although the provision of an ILL service is essentially labour intensive, other hidden expenditures met centrally by the Library system or the University should be apportioned to the ILL service, in particular telephone, postage, printing and stationery, and light and heat and power. It is considered that after examination of these items of expenditure, that an amount equivalent to 20 per cent of salary costs, i.e. \$15294 should be added to cover such items.

It is therefore estimated by this method that the total cost of operating the ANU ILL service in a full year is \$102,130.

Apportionment of total annual costs as at 30 June 1977 prices between the ILL unit and other service staff is shown in Table 7:

TABLE 7

	<u>ILL Unit</u> \$	<u>Other Staff</u> \$	<u>Total</u> \$
Salaries	52,566	23,906	76,472
Salary related cost	<u>4,311</u> 56,877	<u>6,053</u> 29,959	<u>10,364</u> 86,836
Overhead 20% salaries	<u>10,513</u> <u>67,390</u>	<u>4,781</u> <u>34,740</u>	<u>15,294</u> <u>102,130</u>

Costs per transaction

An assessment of gross costs may be concluded when the cost of a service is established. Such a conclusion, however, may yield self evident results when an exclusive service is rendered or fail to provide useful management information. Where the service has completed a considerable number of transactions, and statistics have been maintained, it is a simple task to derive the cost per transaction. Furthermore when it is known that the cost of some types of service provided is disparate, this has usually been established by different and more detailed previous or concurrent studies and where statistics exist for each type of service provided, weighting of costs can be achieved by extrapolation and a more detailed analysis supplied for management purposes.

The incorporation of other known and valid factors into a gross cost situation when

allocating costs over a number of services is an accepted management practice which permits the extension of a gross service cost to a cost per transaction.

Statistics for ILL transactions throughout the Library system have been maintained for some years. In 1977, 15793 requests were fulfilled of which ANU borrowed 5404 and lent 10389.

The detailed survey conducted during July/August 1977 indicated that the ratio of costs for borrowing/lending was 1.4:1. On this basis, total annual cost of \$102,132 could be allocated as follows:

Borrowing	1.4	x	5404 transactions	=	7,566
Lending	1	x	10389 transactions	=	10,389
					<u>17,955</u>

Cost per transaction would be

Borrowing	$\frac{7566}{17955}$	x	$\frac{\$102,132}{5404}$	=	\$7.94
Lending	$\frac{10389}{17955}$	x	$\frac{\$102,132}{10389}$	=	\$5.69

It is assumed that the ratio of 1.4:1 truly reflects the situation. This ratio could only be revised after a further detailed survey of costs.

An allocation of the transaction costs into component costs can be made by simply applying the ratio salary:salary related:overhead costs to the borrowing or lending transaction cost. This exercise has been completed and details are shown in Table 8.

TABLE 8

	<u>Annual Costs</u>		<u>Transaction Cost</u>	
	\$	%	Borrowing \$	Lending \$
Salary	76,472	75	5.99	4.26
Salary related	10,366	10	0.75	0.58
	<u>86,838</u>			
Overhead	15,294	15	1.20	0.85
	<u>102,132</u>	<u>100</u>	<u>7.94</u>	<u>5.69</u>

Conclusion

This method of assessing the transaction costs is dependent upon periodic surveys which are needed to confirm the total number of staff engaged in ILL activities throughout the Library system, the classification of staff other than the ILL unit staff so employed and the ratio of borrowing to lending costs. Reliance upon variables such as these is always questionable after lengthy periods where the method of dealing with ILL requests changes, or when the number of requests processed varies from the past annual average.

Salary costs, which may be assumed as fixed, vary with the changing level of staff appointment and rate increases; the calculation of salary related costs not only change as salaries do, but are also subject to intermediate changes. The reliability of figures should not be assumed, but as they are simple to extract, they should be recalculated afresh for each exercise.

This method of assessing gross costs and apportioning them to a known number of transactions is a relatively reliable management tool providing management is aware of assumptions made and the inherent weaknesses of such assumptions.

V. CONCLUSION

This study of the costs of the inter library loan system at the Australian National University has employed two measures of costs. The more detailed study employed a diary form to discover times spent in discrete tasks on individually numbered ILL items (and also on on-going items for the first month). The gross costs study worked with information available in library personnel files (i.e. salary rates, superannuation cover and other salary related costs) and the statistics collected by the ILL Unit (which reveal the numbers of ILL requests processed during the year and the ratio of fulfilled to unfulfilled transactions).

The two separate approaches have allowed for comparison of cost estimates and provided a check on the figures produced and on the assumptions built into these figures.

Comparison Between the Two Studies of Costs

The following table presents the comparable results from the two approaches.

See over page -

TABLE 9

Main cost estimates from both the diary study and gross costs study at 30 June 1977 prices.

	Diary Study	Gross Costs Study
1. Monthly costs (July 1977)	\$6,831	
2. Annual costs	\$96,500	\$102,132
3. Cost per item, i.e. processing costs	- \$98,000	
- borrowing	\$5.56	
- lending	\$3.72	
- average	\$4.27	
4. Cost per fulfilled transaction		
- borrowing	\$7.43	\$7.94
- lending	\$5.28	\$5.69
- average	\$5.96	

The two studies provide independent measures of the same phenomenon only to the extent that that they are separate approaches and are not tied to the assumptions and limitations of the other.

The estimates given in each study of the annual cost to the Library of operating an ILL service are independent measures. Certainly the gross costs study made use of the diary study estimates of the amount of time contributed to the ILL system by those outside the ILL Unit, but these would be much more reliable measures than any obtained by asking the individuals involved or their supervisors to provide their own estimates.

On the other hand, the costs per fulfilled transaction are not independent measures. The gross costs study makes use of cost ratios developed in the diary study. These ratios represent the cost of processing incoming as against outgoing requests. In calculating these costs, the diary study made certain assumptions. These become part of the gross costs study's calculations of transaction costs. This should be kept in mind in any comparison of results.

Discrepancies Between the Results of the Two Studies

The reasons for discrepancies between the results are mentioned earlier in the Report. They are, in brief,

- i. that very little recreation leave is taken in July and during this study very little sick leave as well. Costs, therefore, were lower than in months when the amount of recreation leave and sick leave are high. The projected annual cost provided by the diary study should therefore be considered less reliable than that provided in the gross costs study.
- ii. that the 20% loading to cover overhead costs is based, in the gross costs study on salary only figures, whereas, in the diary study, it is based on salary plus salary related costs (with the exception of Table 3).

The Problem of Selecting an Adequate Sampling Period

This report has attempted to present in an honest fashion the shortcomings of our particular study. It is obviously important that these be understood. It should be made clear, however, that the error we made was difficult to foresee. A whole month's data and two month's information on a sample of nearly 2,000 requests seemed more than adequate. Indeed, we do have adequate information for establishing accurate costs for the month of July. What we have lost is the detailed information about our sample. The conventional diary method was modified so that we would have have two separate groups of data:

- (i) data about how much time library staff involved in ILL work, spent in various tasks over an entire month, i.e. a detailed picture of the workload of the entire ILL system;
- (ii) data about a large sample of ILL requests which would show what tasks were done on each request, by whom and when, thus allowing for a study of the variability in processing time and costs of ILL requests.

The first was achieved but not the second. The sampling period did not allow for the amount of variability in the time required to process ILL requests. The analysis of the sample data indicates several superimposed distributions.

- (i) The first, a short highly peaked distribution, representing requests that

are responded to immediately and leave the system within 24 hours requiring no further work.

- (ii) The second, a group that require more processing time, 2-5 days, but which also require no further processing beyond that initial period.
- (iii) A third graph representing monographs, etc. which the system 'must keep track of' and which re-enter the system when they are returned to the ANU or are discharged from the system after several weeks on loan to the ANU and returned to the library of origin.
- (iv) A final distribution represents the difficult requests that cannot be resolved easily and which stay in the system for very extended periods, 4-6 months or more.

Our sampling period lost the tail of the third distribution and failed to take account of the fourth.

As was stated earlier in the Report, anyone attempting a similar study should, in their choice of sampling period, allow for this high degree of variability in ILL requests. It is worth remembering as well that there are problems associated with adopting a very long sample period in a study such as this. Apart from the problems of staff morale mentioned earlier, there are questions of cost, redundancy of information and so on.

VI COSTING STUDIES AND THEIR IMPLICATIONS

A number of concerns lie behind this study and will determine what is done with its findings and what additional research will be undertaken. If the question of costs has taken pre-eminence for the moment, the long term problems remain - how to restructure the national system so that it can become a more equitable and more efficient system and one that can cope with the likely increase in demand.

Although costs studies such as this cannot speak to these wider concerns, they are an important, if very small, first step and the discussions which follow as a result of these kinds of studies may pre-determine decisions taken in the wider field. They will certainly precede any action taken in these other areas.

The most pressing question has become whether or not to levy a charge for ILLs. If a charge is to be levied, who is to be charged, what proportion of processing

and materials costs will the charge aim to cover, what methods of charging and receiving payment will be implemented.¹

This study has not attempted to answer these questions but by producing 'cold hard figures' it does force policy makers to confront the issue for what it is. The ANU spends around \$100,000 per annum to maintain what is

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1. At present, no public, university or college library in Australia charges for all the material it lends. These libraries, do, however, charge for photocopied material which is more than a prescribed number of pages (usually twenty). The National Library of Australia charges for loans made through ANSTEL (Australian National Scientific and Technological Library) but not for material provided through the Loans and Location service. The Library Association of Australia is now implementing a redeemable voucher system which provides for payment by voucher for all photocopied material at the rate of one \$1 voucher for each unit of up to ten pages of an article as cited. Loans of original material will remain free of charge for the time being. The system has not been welcomed by all and any attempt to extend this limited charge to a charge for all inter-library material is likely to be repugnant to most members of CAUL (Committee of Australian University Librarians) and AACOBS (Australian Advisory Council on Bibliographical Services).

virtually a free service.¹ About \$43,000 is spent in providing our own users with an ILL service and about \$59,000 in providing ILL requests to outside libraries. If this is the cost we are bearing now, the question becomes, can we go on bearing this cost and should we be expected to go on bearing it. If we continue not to charge, what other areas of library service might have to be cut back. It is a question of priorities.

When the question of charging users for one library service is raised, we are forced to consider the question in relation to all library services. What is now required in this Library and other libraries facing the same dilemmas is a clear policy or rationale for the introduction (or avoidance) of user charges.² But what is also needed is a framework for establishing priorities and for assessing the consequences of not charging for services that command a considerable proportion of library budgets.

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1. The charge is passed on to an ANU user only if the ANU Library is charged more than \$1 for a loan from within Australia and more than \$2 for material acquired outside Australia. Outside borrowers are charged by the ANU for photocopied material of more than 20 pages or for postage, if airmail delivery overseas is required.
 2. See, eg. a recent article by John Linford, "To charge or not to charge", Library Journal, October 1, 1977, 2009-2010.

APPENDIX I

Definitions of discrete tasks

Verifying - establishing that an item is or is not available within the ANU Library system; establishing in which library(ies) the item is located; establishing the correct citation of a request in order to refer it to another library; "quality control" functions exercised by the ILL Unit; deciding where to direct the request.

Record Keeping - recording data on the yellow record card used by the ILL Unit; typing of the request form; recording the progress in acquiring the loan; filing; maintaining records of ILL material which must be used within the Library; all work relating to ILL material carried out on circulation desks which involves handling ILL material separately.

Locating Article - finding material and delivering for ILL photocopying or despatch to an outside library.

Photocopying - all photocopying associated with ILL work and the checking of page numbers and references of photocopied material before despatch.

Packing, Unpacking, Mailing - unwrapping original documents which have been sent to the ANU; placing the original in a wrapper for return to the library of origin; applying the mailing label and postage; preparation for mailing of original requests.

Accounting - arranging a prepayment memo for overseas material; sending out of "please-charge-memo" to departments and to Acquisitions; sending of receipt numbers and data of payment to Acquisitions; charging against a scholarship number; etc.

Communication with User - communicating with the requester to obtain clarification of information, to obtain additional information or to pass information on to the requester.

Supervision or Administration - all consultations which relate to work processes or conditions,

leave requests, etc. (i.e. all such discussion other than that which related to particular requests); writing of letters other than those connected with a particular request; making decisions about procedures and informing staff.

Compiling Statistics - the totalling of numbers, summarising, typing and sending to library administration.

APPENDIX II

The three graphs which follow depict the relationships between three important categories of requests in the sample. The heavy lines represent the proportion of completed requests, the double parallel lines the proportion of requests whose status is uncertain and the single line the proportion which is definitely incomplete.

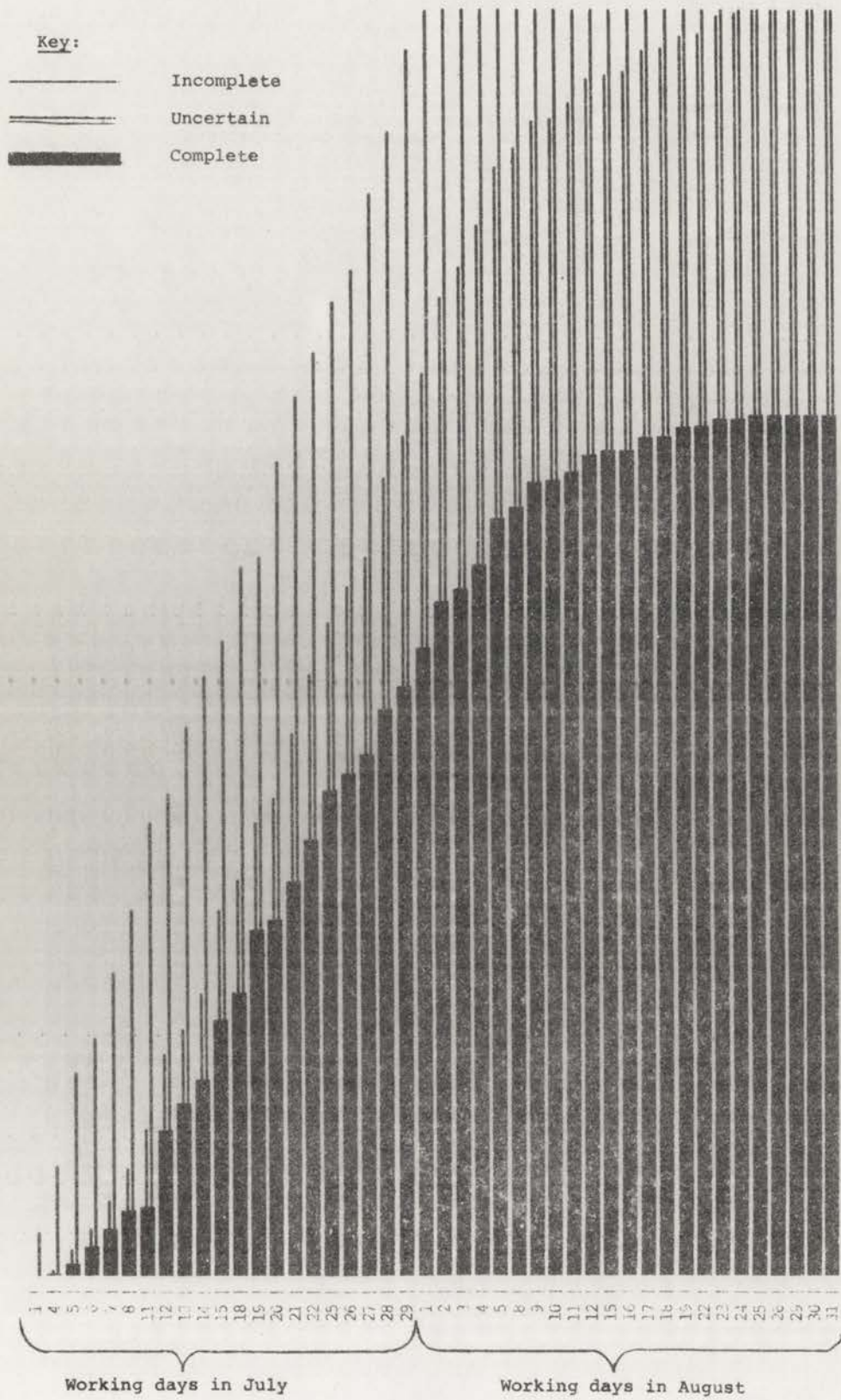
Graph A refers to the lending requests, Graph B to the borrowing requests in the sample, and Graph C to the whole sample (half scale).

A request is registered as definitely complete when it has been designated as "complete" and no further work is done on it. A request remains in the uncertain category when it has been designated as "complete" but has had further work done on it and no final indication that no further work remains to be done. A request remains in the definitely not completed category when no "request complete" designation has been applied.

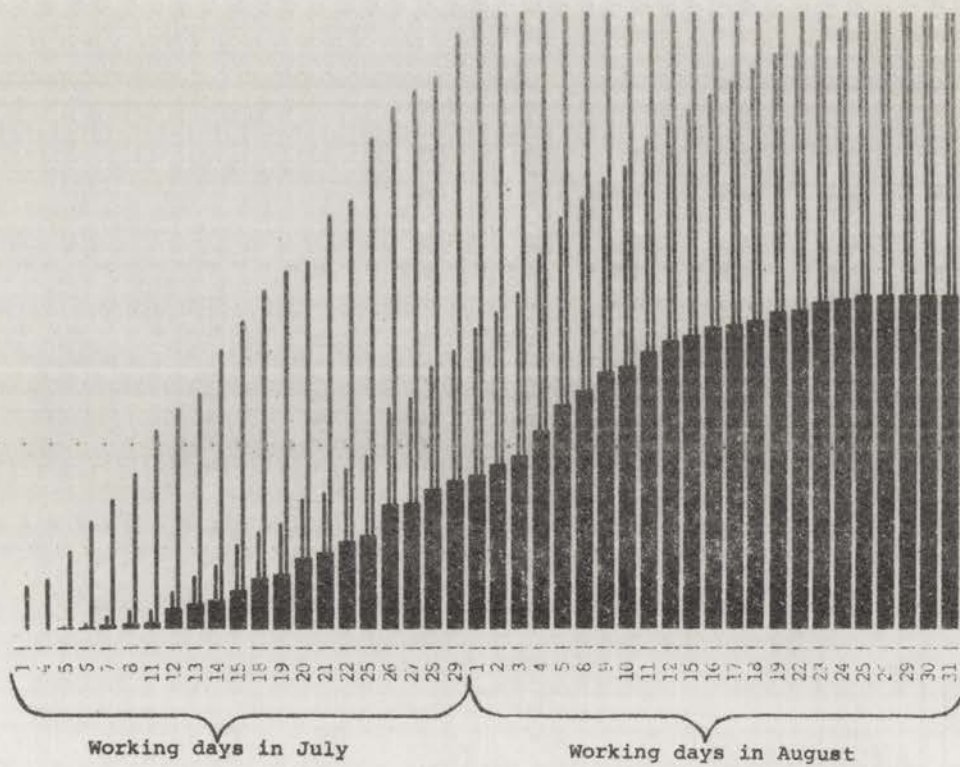
At the end of the sampling period all requests which are not definitely completed are designated "uncertain". None are classified as definitely incomplete as it is not known whether or not further work will be done on these requests.

GRAPH A.

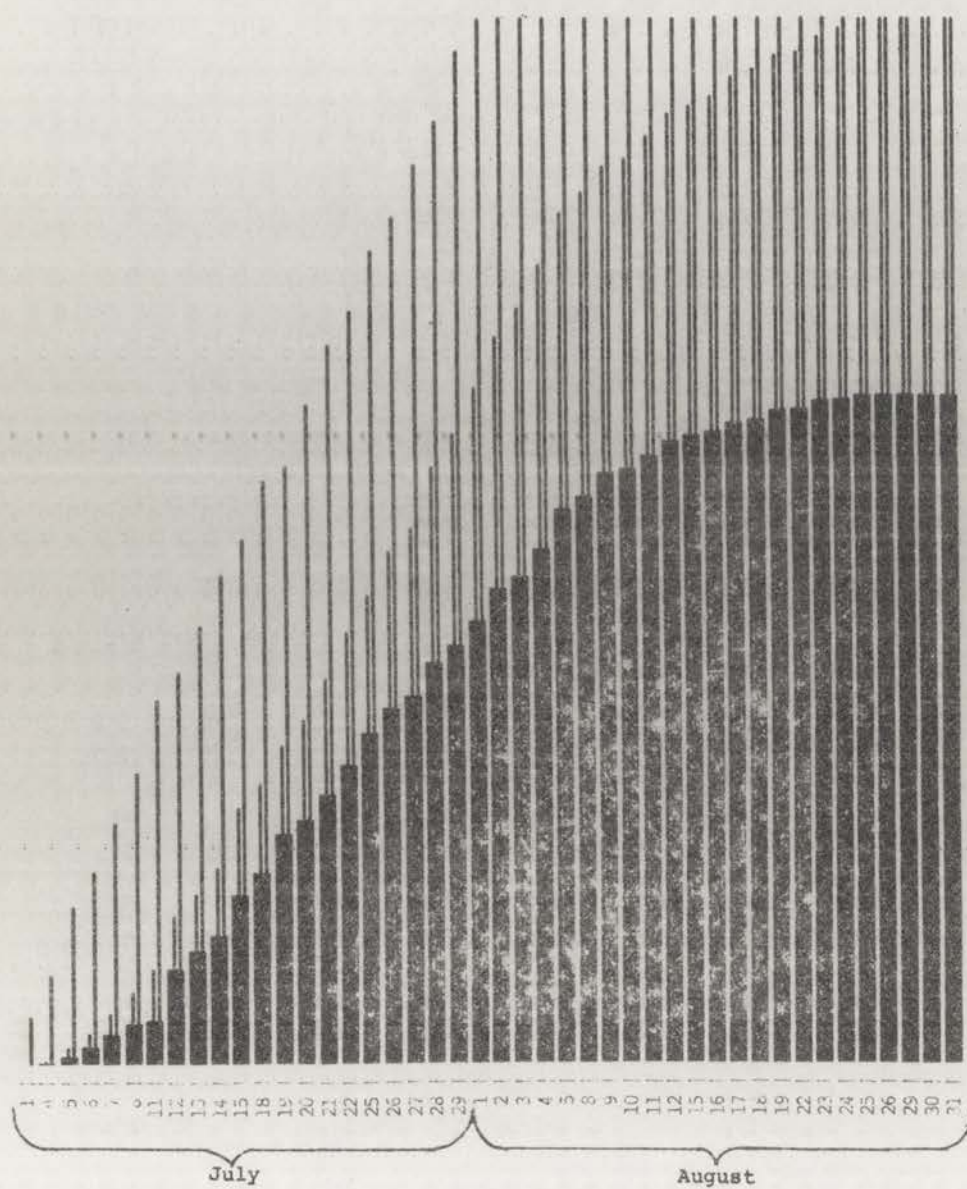
Lending sample - proportions of complete, to uncertain, to incomplete requests.



GRAPH B. Borrowing sample - proportions of complete, to uncertain to incomplete requests.



GRAPH C. Whole sample (half scale)



APPENDIX III

ILL Survey Program Descriptions

GENERAL All programs were written in Fortran (some with sections in Assembler) for an Interdata 8/32 computer. Programs and data were input using Teleray terminals; and printed output was produced on an Interdata Carousel 300, and a Diablo 1620.

LABX4 This is a general program to print 4-wide $1\frac{1}{2}$ " x 7/16" sticky labels in red or black. The console asks for input and the program has several options. There can be a title of up to 14 characters e.g., ILL SURVEY; there can also be a number of up to 9 digits with or without a Modulo 11 check digit. The survey used red labels for borrowing requests and black for lending with a 4 digit number plus check sum.

ILL This program was used to create a data file from the information on the work sheets. The date, location and name codes are inserted once for each sheet, but this information is stored in each record for that sheet. The program asks for the following information for each record (inserted in one line):-

- a) item no. - allows blank for ongoing request;
- queries an incorrect check digit.
- b) start time - inserted as am, pm or 24 hour but converted to and stored as 24 hour day.
- c) end time/
duration - stored as duration.
- d) task type - one or two tasks may be recorded as being performed at the one time.
- Full stop (.) indicates completed request.

There was no provision in this program for correction of typing or coding errors once

the record was accepted and added to this file.

ILLEDIT was used for altering records in the data file; i.e. for correcting typing and coding errors. It asks for the number of the record to be changed and shows that record on the screen as it is in the file. Alterations are made by typing the correct digit(s) underneath those to be changed. As spaces are treated like ditto marks and allow the field above to remain unchanged, spaces are inserted into the record by typing ' '. The new record shows on the screen and asks 'Correct? (Yes/No)'. If the answer is 'Yes' - 'Record altered'; if 'No' - 'Record unchanged'.

BDUMP is a frequently used general program. Its usefulness in the survey was in obtaining record numbers of ILLEDIT. Starting at a specific line or record number, 20 lines of the file (with line numbers) are shown on the screen. Output can be directed to the printer.

ILLNINE Another aid to ILLEDIT. It lists, with record numbers, those records which have a task 9, i.e., there was some doubt as to what was being done at the time and a 9 was inserted in the task column to allow for subsequent editing.

ILLSORT This is a sort-merge program which uses the data file to compile a key file containing item no., date and time in ascending order plus the corresponding record number in the data file.

ILLIST prints all or sections of the data file. Location, name and task codes are converted and printed in full. There appeared to be little use for this program.

ILLPRINT lists the sorted file (numbered requests only) in sections beginning at a specified page and record number. This enabled us to do the printing over several days. The location, name and task codes were converted and printed in full. And a total duration was given at the end of each request.

ILLAVE divides the sorted file into borrowing and lending requests and produces the following figures for each :-

- a) number of requests
- b) average duration of requests
- c) maximum duration
- d) minimum duration
- e) average number of days in the system
- f) maximum " " " " " "
- g) minimum " " " " " "

ILLHIST is a program to print vertical histograms of variable width. Values are typed in on the console or a data file can be used. The program then calculates the correct vertical scale for 15" x 11" paper (horizontal scale is worked out manually) and prints the histogram. Asterisks (*) indicate the average; full stops (.) are at the top of the bar if it does not coincide with a scale boundary; and the remainder are dashes (-).

ILLFIL scans the sorted data file to produce a) borrowing file, b) lending file and c) administrative file (i.e., negative item numbers). The remaining un-numbered items (ongoing) are taken from the unsorted file and placed in an ongoing file. These four files were used to produce the cost/duration tables.

ILLCOST produces the following tables for the borrowing and lending files created by ILLFIL - each file has a separate run.

staff x task tables

- 1) number of times performed
- 2) costs
- 3) durations

location x task tables

- 4) costs
- 5) durations

These tables are printed for July and August, and for the two months combined. The program also calculates the maximum and minimum cost of requests.

ONG prints the 5 tables listed in ILLCOST from the Ongoing file for July only.

ADMIN
&
ADTOT are both programs which use the administrative data file to produce staff x task/leave tables; again for July only. Table 1 prints costs; table 2 prints durations. ADTOT includes all costs and durations in the totals. ADMIN does not include flex and casual leave and non-work day costs and durations in the totals.

ILLEND is a program to check the status of requests. It scans an assigned file (e.g. Borrowing or Lending) noting when a number was first used. It then checks whether that request has been marked as being completed and, if so, whether any extra work has been done on it after completion date. This information is placed in three categories.

- a. definitely complete - marked complete with no further work,
- b. uncertain - marked complete but has had extra work done,
- c. incomplete - not marked complete

ILLTSA prints the graphs in Appendix II on a DIABLO 1620 printer. Each graph was produced by using three keys [vertical bar (|); colon (:); and period (.)] and by altering the variable horizontal motion index (HMI) to give minimum forward movement of the carriage.

FULL PROGRAMMING DETAILS ARE
AVAILABLE ON REQUEST.