An automation plan for

Pusak Dokumentasi Ilmiah Nasional

Penang 1986

CONTENTS

	Page
CONTENTS	ii
LIST OF FIGURES	iii
LIST OF TABLES	iii
SECTION I. INTRODUCTION	1
Background	1
Significant Developments in Indonesia	2
Organisational Structure of PDIN	4
SECTION II. LIBRARY DIVISION	6
Acquisitions	6
-- Automation of Acquisitions	14
Serials	19
-- Automation of the Serials Section	23
Technical Services	27
-- Automation of Cataloguing	27
Reader Services	33
-- Automation of the Circulation Control System	42
SECTION III. BIBLIOGRAPHY DIVISION	47
Automation	48
SECTION IV. RECOMMENDATIONS	59
1. In-House Systems Development	59
2. Automation Priorities	60
3. Bibliography Division	60
4. Technical Services Division	65
5. Assistance to the National Library of Indonesia	66
6. Quality of Printed Outputs	68
7. Acquisitions Section	69
8. Serials Section	69
9. Reader Services Section	70
10. Developing In-House Expertise	71
11. Technical Consultants	73
12. Acquisition of a High Level Language Compiler	74
13. End User Involvement	75
Concluding Remarks	78
APPENDICES	
1. List of Persons Consulted	79
2. Comparison Between UNIMARC and PDIN RD Database Format	80
3. References	84

LIST OF FIGURES

Page

FIGURES

1. PDIN Organisational Chart 5
2. Acquisitions: Order Sub-system 8
3. Acquisitions: Receipts Sub-system 11
4. Serials System 20
5. Cataloguing System 31
6. Circulation System: Membership Registration 35
7. Circulation System: Charging 36
8. Circulation System: Discharging 38
9. Circulation System: Overdues 39
10. Circulation System: Reservations 40
11. Circulation System: Renewals 41
12. Current Awareness Service 52
13. Literature Search Service 55
14. Model of User Participation 77

LIST OF TABLES

TABLES

1. Telecommunications Charges for Data Access 56
2. Pilot Project to Access External Information Services 64

SECTION I. INTRODUCTION.

BACKGROUND

I.1. The consultancy mission was carried out between 12th and 23rd December, 1985, at the invitation of the International Development Research Centre. The terms of reference of the consultant were as follows:

* To survey the existing manual and automated processes in operation at the Pusat Dokumentasi Ilmiah Indonesia (PDIN), Jakarta and to undertake a complete system analysis leading to integrated computerization of its library and documentation operations and services;
* To prepare a draft detailed workplan for the implementation of an integrated computerized system including financial and human resources (and possible external consultancies) required.

I.2. In addition to the above terms, it was suggested during the consultant's visit that some recommendations should be made as to how PDIN could assist the Perpustakaan Nasional Indonesia (National Library of Indonesia) in the production of the National Bibliography, and especially in the production of machine readable data for the SEAPRINT project.

I.3. After Jakarta, the consultant also paid a short visit to the National University of Singapore Library on 23rd December to observe the MINISIS operations there. Appendix 1 lists the persons whom the consultant met while in Jakarta and Singapore.

I.4. The consultant wishes to acknowledge with many thanks the cooperation extended to him by the PDIN, National Library and NUS library staff. In particular, he would like to record his thanks to

Ms. Luwarsih Pringgoadisurjo, Director of PDIN, Mr. Blasius Sudarsono, Head of the Library Division, and Ms. Nurasih of the Computer section for their kindness and hospitality. Furthermore, he would like to record his gratitude to Ms. Mastini Hardjo Prakoso, Director of the National Library, for her hospitality, and to Mrs. Peggy Hochstadt, Chief Librarian of NUS, for the special effort she made to welcome the Consultant even though she was on leave during the festive season.

SIGNIFICANT DEVELOPMENTS IN INDONESIA

I.5. In a sense, the consultant's visit to Jakarta was timely as a number of encouraging developments in the library and information field are occurring in Indonesia. The developments may be summarized as follows:

* Expansion of library schools. The Indonesian Government has recognised the need for more trained manpower in the library and information field, and has developed plans to increase the output of librarians and information scientists in the country. In this connection, there are plans to expand the library schools at the Universitas Indonesia and at the Institut Teknologi Bandung. At the Universitas Indonesia, the British Council has provided a consultant for a period of two years in the person of Mr. Frank Hogg, Principal of the College of Librarianship Wales. Mr. Hogg's terms of reference include assistance in curriculum revision and development plans, and the preparation of the architectual brief for the new library school campus.

* Expansion of library and information services. The World Bank is currently negotiating with the Indonesian Government about

the possibility of providing a loan to help improve the library system in the country. This assistance will be concentrated on the development of provincial libraries currently under the portfolio of the Centre for Library Development. The National Library will also receive assistance to develop an automated library network. The nature of this assistance is still not very clear, but there are expectations that assistance will be extended not only towards the automation of the internal operations of the National Library but also the establishment of an online network (probably along the lines of the Australian Bibliographic Network or OCLC). It should be emphasized that negotiations are still at a very preliminary stage, and the World Bank has not yet sent its consultants to assist in the preparation of the loan submission. The whole process of negotiation for a World Bank loan is a long drawn out one, and could take up to twelve months or more.

* BOSTID (Board of Science and Technology for International Development) has been approached to provide assistance to develop a scientific and technical network in Indonesia with PDIN as the focal point. Since the nature of this assistance is still under discussion, the consultant was unable to obtain further details on this matter.

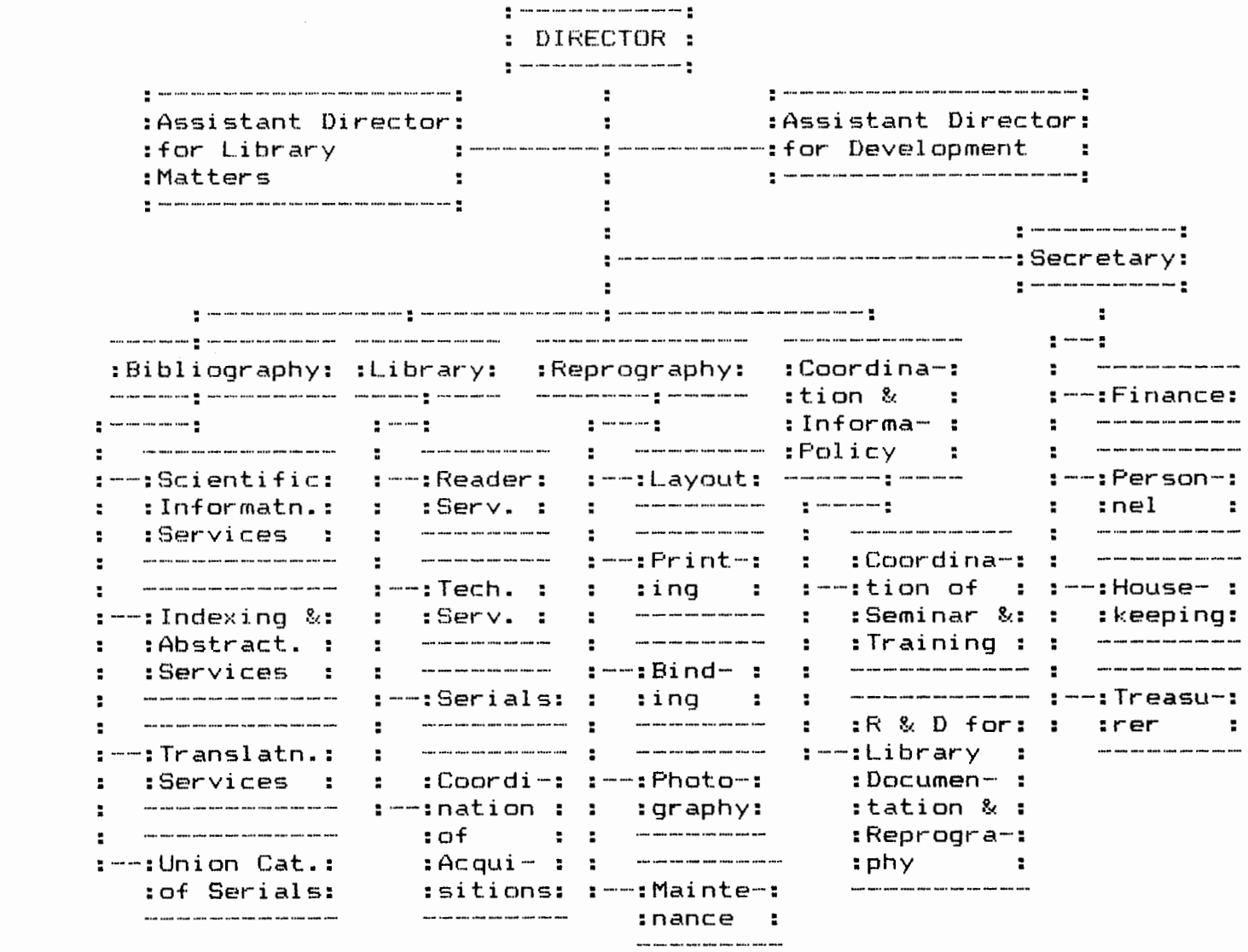
* The Indonesian Government is in the process of developing a Science Park at Serpong, just outside Jakarta, where the major scientific laboratories will eventually be located. PDIN has been asked to assist in planning a central scientific and technological library to serve these laboratories.

I.6. It can be seen that in many of the above developments, PDIN will have a central role to play in the next few years. However, because PDIN is a major information resource in the country (and has arguably the most sophisticated equipment and experienced manpower among Indonesian libraries and information centres), it is very likely that it will be involved in the development of training programmes, in the planning of library and information systems and in providing assistance to develop automated systems.

ORGANISATIONAL STRUCTURE OF PDIN

I.7. The objectives and activities of PDIN have been described in a number of documents and need not be repeated here. Of interest to the consultancy, however, is the organisational structure and this is reproduced below from the PDIN-LIPI Three five-year development report, 1969/1970 - 1983/1984. It should be noted that only the Library and Bibliography divisions were considered to be relevant to the terms of the consultancy, and as a result only the systems in these divisions were analysed. In any case, there was insufficient time to study the workings of the other divisions, viz. the Secretariat, the Reprography division, and the Coordination and Information Policy division.

FIG. 1. PDIN ORGANISATIONAL CHART



SECTION II. LIBRARY DIVISION

II.1 As shown in the organisation chart (Fig.1), the Library Division comprises four sections, viz. Acquisitions, Serials, Technical Services and Reader Services. The paragraphs that follow will provide details of the current manual proedures as well as suggestions relating to the automation of the sections concerned.

***** ACQUISITIONS *****

II.2. This section is responsible for the purchase of materials for the PDIN library as well as for the central library at Bandung, which serves a number of LIPI institutes. There is some overlap with the work of the Serials section in that serials funded from the development budget are handled by the Acquisitions section, while serials purchased from the routine budget are processed by the Serials section. A large number of publications are also acquired through gift and exchange. According to the PDIN Annual report, April 1984 - March 1985, nearly 75% of the annual acquisitions are received as gifts or through exchange. Figs. 2 and 3 provide a detailed analysis of the current acquisitions procedures.

II.3. The following are some notes and comments relating to the present manual procedures:

* Three main files pertaining to acquisitions are maintained:
  - a file of requisition forms (called formulier desiderata) which are filed by vendor.

- A file of order cards specifically typed after a decision has been made to order an item. These cards are filed by author/title and the file is a permanent record of all foreign publications ordered by PDIN.

- A purchase order file with the forms filed by date. These forms are actually requests for pro-forma invoices, since all items ordered from overseas are paid for in advance.

* The three files above could be reduced to two by eliminating the file of order cards and substituting that with the file of requisition forms, which could be arranged alphabetically by author or title. As far as the consultant could ascertain, the file of requisition forms arranged by vendor name was seldom used, and consequently, there is really no necessity to maintain this file.
* Record keeping regarding orders for Indonesian publications appears to be deficient and is not as thorough as that pertaining to foreign publications.
* Consideration should be given towards devising a multi-part order form since this would save considerable typing time.
* More attention should be paid towards the development of an effective claiming system.

Fig. 2. Acquisitions: Order Sub-system

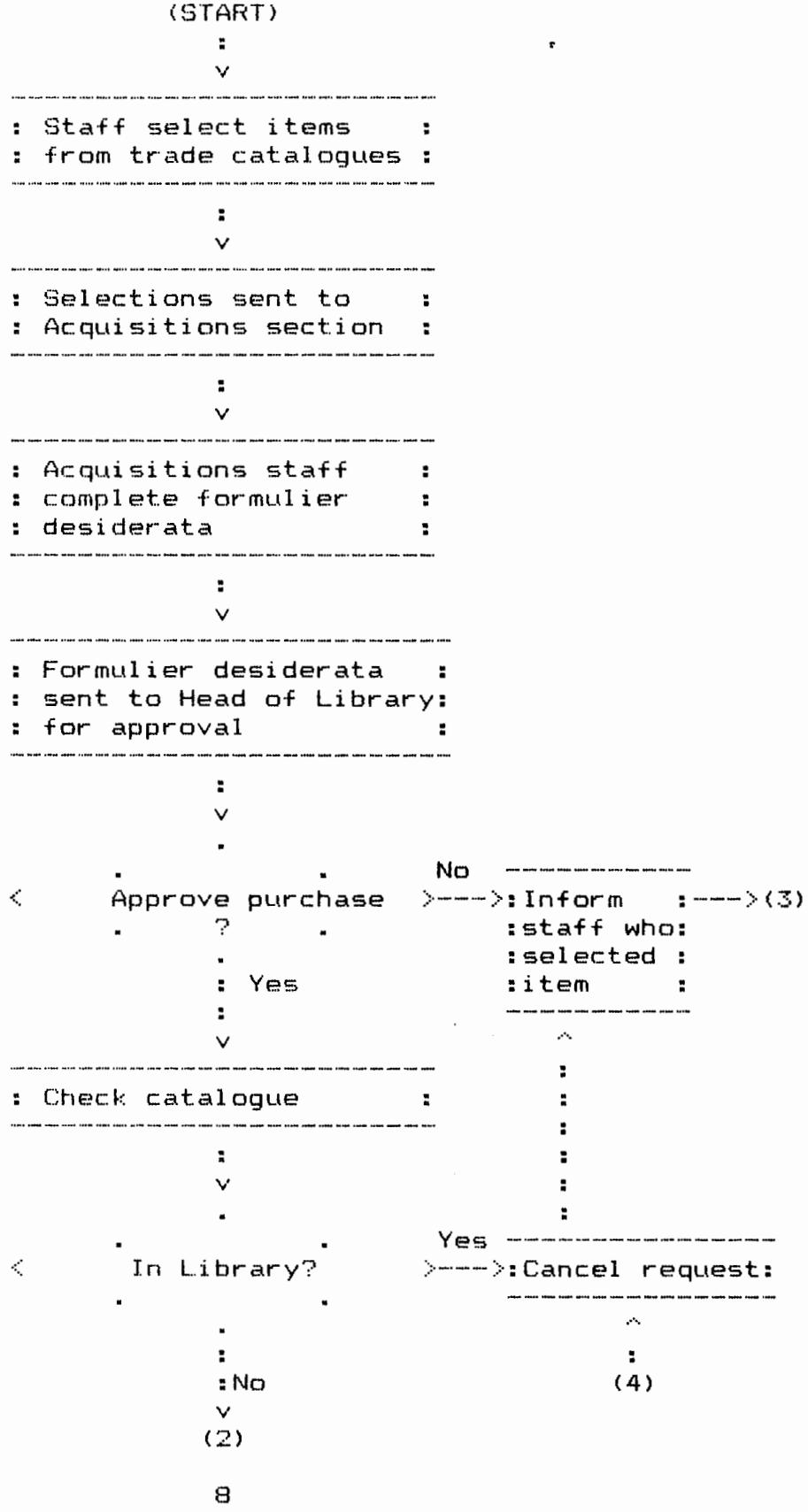


Fig. 2. Acquisitions: Order Sub-system. (cont'd)

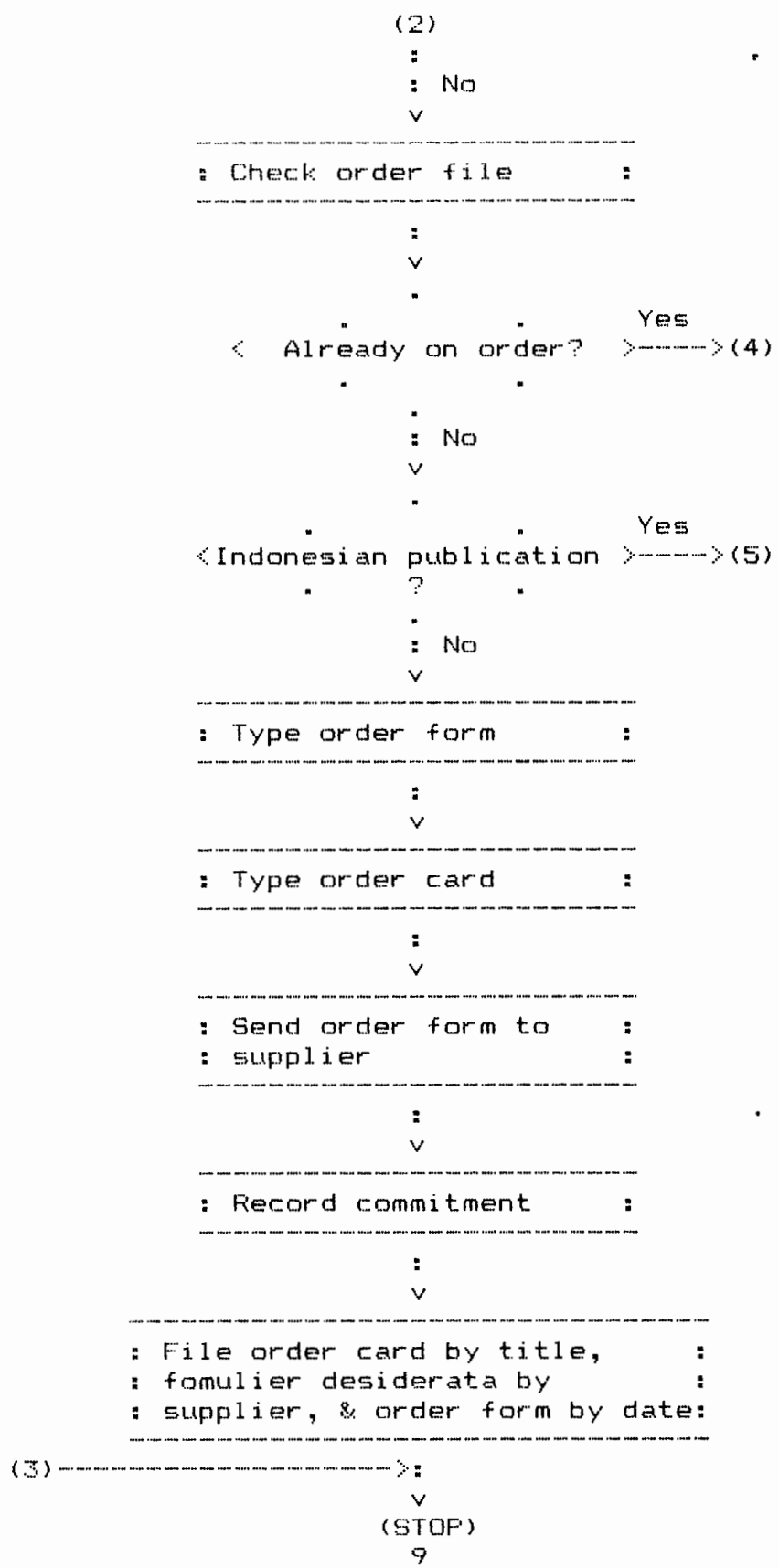


Fig. 2. Acquisitions: Order Sub-system (cont'd)

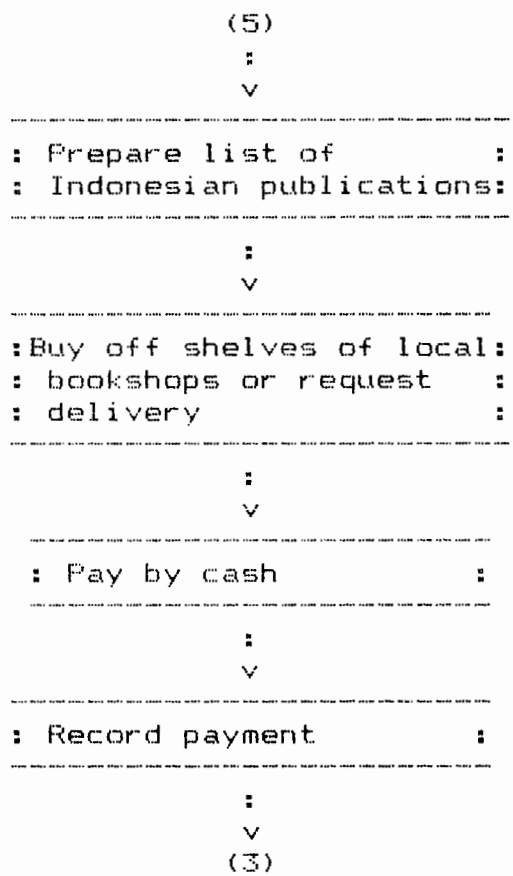


Fig. 3. Acquisitions: Receipts Sub-system.

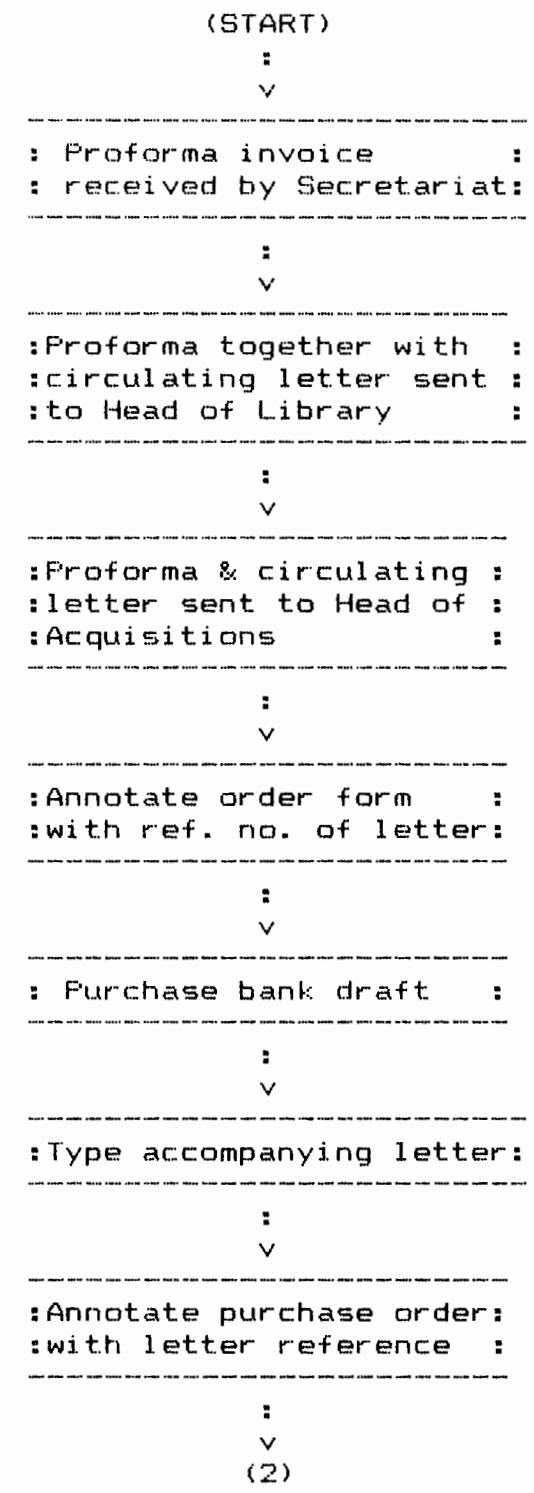


Fig. 3. Acquisitions: Receipts Sub-system (cont'd)

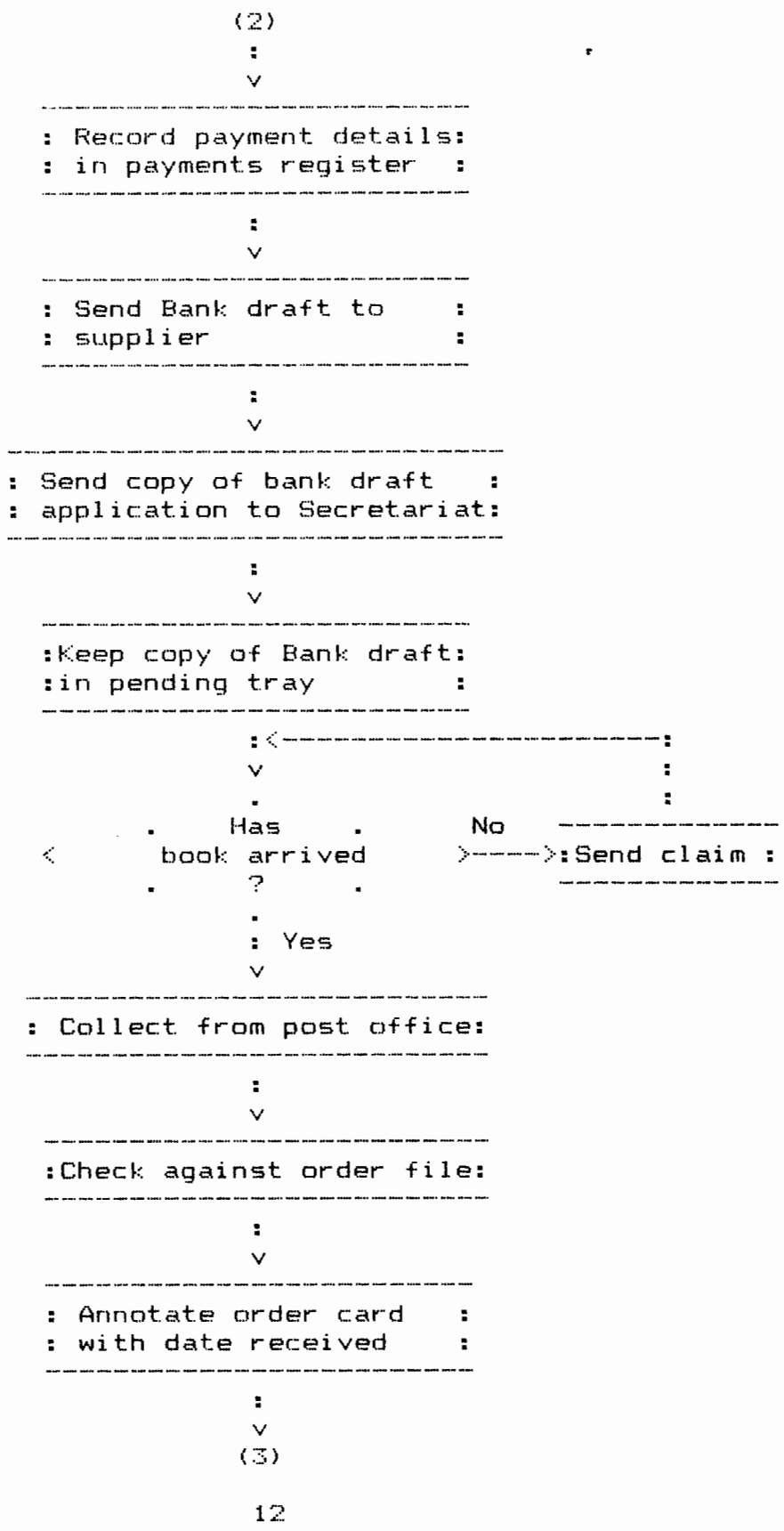
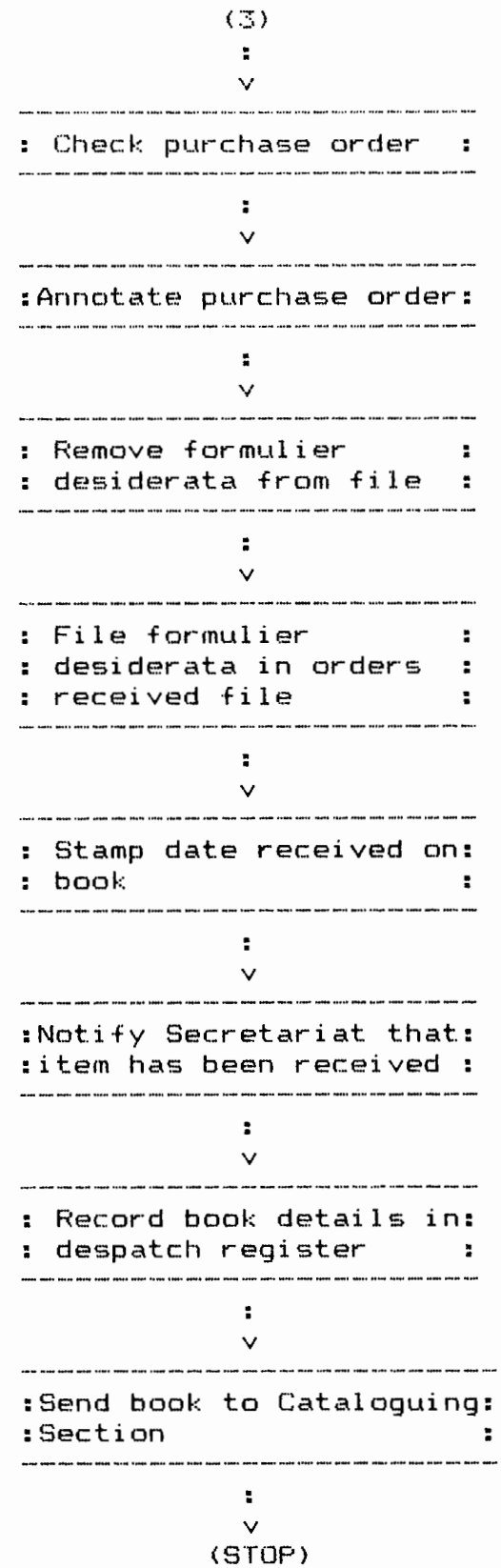


Fig. 3. Acquisitions: Receipts Sub-system. (cont'd)



Automation of Acquisitions

II.4. The activities related to acquisitions are relatively complicated and involve a great deal of detailed and exacting paper work. They are very labour intensive because of the need to ensure that duplicate items are not purchased, that the materials supplied match the orders and the invoices, and that vendors do not impose excessive charges. In addition, available funds have to be constantly monitored in order to ensure that the expenditure does not exceed the funds allocated. Unlike the other functions of the library, acquisitions systems which have been developed in-house appear to outnumber commercially available systems, perhaps because every institution believes that its own operations are unique.

II.5. Acquisitions is a good candidate for automation because computerisation will help to eliminate the maintenance of several manual files and reduce associated staff time, which in turn will eliminate many errors in reporting, control, etc. Furthermore, with automation, it will be far easier for the staff to maintain up to date files of orders and receipts, funds and other fiscal data, vendor data and management data.

II.6. Although variations exist in the way libraries procure items, there are certain standard features and functions which all automated acquisitions systems should have. These will be briefly described below.

II.7. Access to databases. To be able to carry out their tasks effectively, the staff of Acquisitions must have access to a number of data files. These include: the library catalogue (possibly online), authority file of personal names/corporate bodies, current orders

file, order history file, invoice data file, financial data file, and vendor or supplier file.

II.7.1. The need to access the library catalogue is obvious, since this will be required to check for duplicates. Ideally, of course, access to the catalogue should be online, but whether or not this is possible will be dependent on the progress achieved in automating the cataloguing operations PDIN. The need to access an authority file is again obvious, since there is a need to ensure that the order data conform as closely as possible to the cataloguing data.

II.7.2. The current orders file is one of the primary files used in the acquisitions process, as it contains all order records, records for materials received, and records of items which are still being processed. Sometimes this file is known as the in-process file. The current orders file may be thought of as consisting of two modules. The first part or module consists of bibliographic data such as one would find in a catalogue record. The bibliographic data can be derived from the (online) library catalogue or from an external source. Since the data input by the Acquisitions staff can be used as preliminary cataloguing data, it is expected that extra care will be taken to input accurate bibliographic information which will conform with the standards used by the Cataloguing section. The second module will contain data elements which are necessary for the ordering process, such as order number, order date, supplier/vendor code, account code, receipt data, price, invoice data (or code), claims data, requestor's name, notes, etc.

II.7.3. An order history file is a useful archival file to maintain. This file should be summarised from time to time, and purged of all data which are more than five years old.

II.7.4. Some institutions find it useful to maintain invoice data in machine readable form, while other institutions still prefer to maintain paper files of invoices. The choice would be dependent to a large extent on the mode of ordering. It is now possible in the United States and Great Britain, for example, to order books by transmitting orders electronically to the vendor using telecommunications links, and the vendor in turn may transmit invoice data electronically. In such a situation, it would be wise to ensure that the acquisitions system provides for the maintenance of an invoice file which can contain details of all received invoices. Since it may be some time before such a facility was made available in Indonesia, invoices should be retained as paper records for the time being. The burden of having to key in all the invoice details would be too great to justify the maintenance of such a file.

II.7.5. The financial data file should contain all the data necessary to manage and record all commitments and accounting transactions. From the point of view of the Acquisitions section, there is a need to maintain only a record of commitments and payments.

II.7.6. The vendor file is simply a name and address file of all suppliers. It could be a KSAM or RD database linked to the Current orders file by vendor code.

II.7.7. It is expected that the Acquistions system would have search and retrieve capabilities as well as features which will allow orders to be entered and updated. In terms of output, the system must be capable of generating actual orders to be transmitted to the correct vendor. It is expected that for some time to come, the orders will be in the form of paper printouts, rather than as electronic data transmitted over the telecommunications facilities. In this connection, PDIN has the choice of either producing a multiple-part order form for single titles, or a multiple-title order form. The current standard is the American National Standard for Order Form for Single Title of Library Materials (ANSI Z39.30-1982). This is a 3" x 5" multi-part form.

II.8. Other features which should be part of the acquisitions system are:

* Received item processing - the main purpose of this function is to record receipt of all materials ordered for the library or obtained as gifts or through exchange agreements.
* Received invoice processing - when invoices are received, an online facility should be provided for recording invoice details. As mentioned above, the amount of detail captured would be dependent on whether machine readable records or paper files are maintained.
* Claims - the system should be capable of alerting staff members after a predetermined time period of orders which have not been fulfilled, or invoices which have not been received although the items concerned may have arrived.

* Cancellations - as with all procurement systems, a function to support the cancellation of orders is essential. Any cancellation should automatically cause the appropriate fund or accounts to be updated; and if a cancelled item is received, the system should generate the appropriate messages so that the items concerned can be returned to the vendor.

II.9. Finally, the system should be capable of generating reports of all kinds. The main kinds of management reports are the daily activity reports (e.g. no. of order records created, items received, invoices processed, orders cancelled), financial reports (e.g. accounts payable reports, cash flow analysis, fund status reports, invoices paid, foreign exchange report, etc.), database statistics and so on.

II.10. It is clear that it may not be possible to implement all the above features and functions using MINISIS. Nevertheless, MINISIS possesses many powerful featurs which will enable a fairly useful acquisitions system to be developed. What is required is a very clear analysis of the procedures involved in an automated system, and proper designing of the system and requisite stationery. If the staff of PDIN do not think that they have the requisite expertise and experience in this matter, then PDIN should consider the possibility of obtaining the services of a consultant to assist in defining the database and in the design of the automated acquisitions system.

***** SERIALS *****

II.11. The primary responsibilities of the Serials section are as follows:

* Handling foreign periodical subscriptions paid from the routine budget. Apart from subscribing to periodicals for PDIN, the section also handles subscriptions on behalf of nine other LIPI institutes, viz. (1) Lembaga Biologi Nasional, (2) Lembaga Ekonomi dan Kemasyarakatan Nasional, (3) Lembaga Elektroteknika Nasional, (4) Lembaga Fizika Nasional, (5) Lembaga Geologi dan Pertambahan Nasional, (6) Lembaga Instrumentasi Nasional, (7) Lembaga Kimia Nasional, (8) Lembaga Metallurgy Nasional, (9) Lembaga Research Kebudayaan Nasional.

  Only institutes no. 1, 2 and 9 above are located in Jakarta. The others are located in Bandung and are served by the Bandung Central Library which is supervised by PDIN. Journals intended for Bandung are first sent to PDIN for use (in the provision of current awareness services) before being redirected to Bandung. In the case of the other three institutes, the journals concerned are sent directly to them.
* Recording the receipt of Indonesian periodicals, the majority of which are received under the gifts and exchange programme.
* Routing of journals to the staff of PDIN.
* Binding preparation.

II.12 Fig. 4 shows a flowchart of the work procedures in the Serials section.

FIG. 4. Serials System

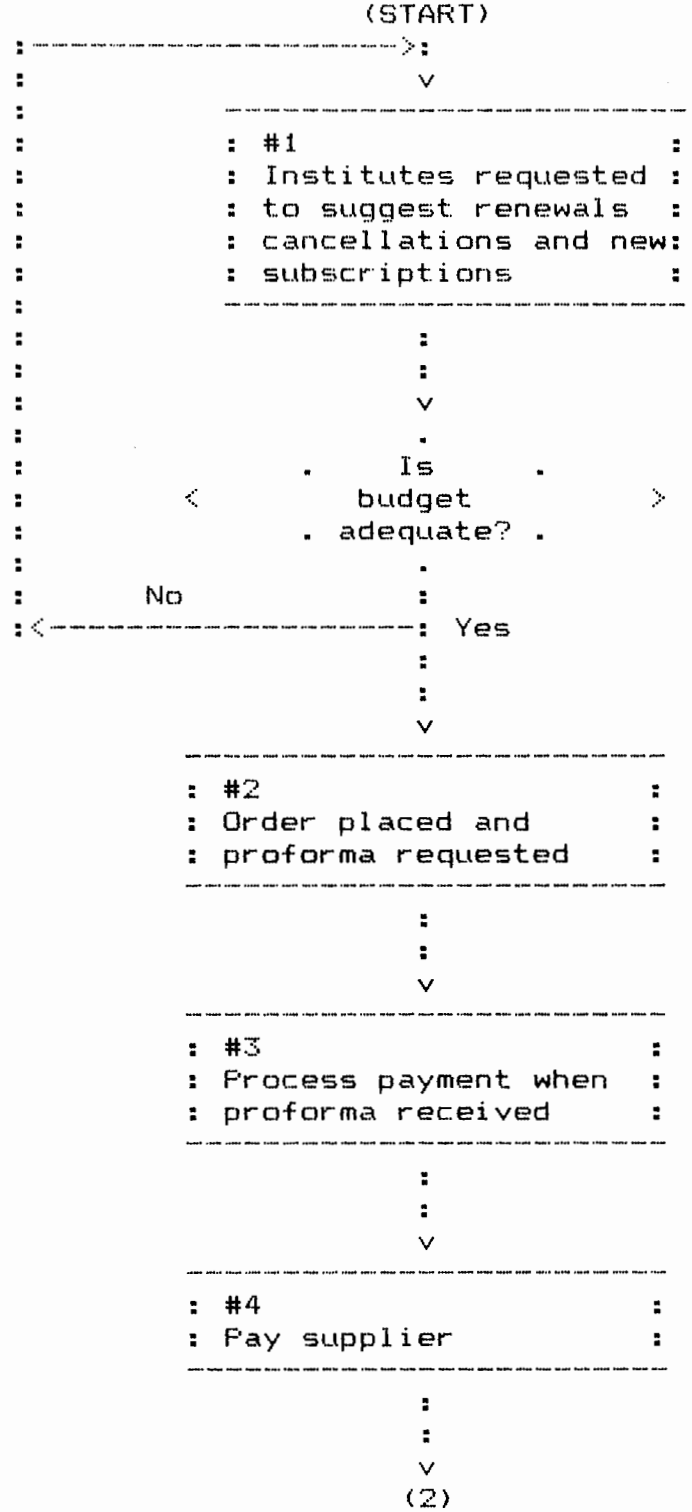


Fig. 4. Serials System (cont'd)

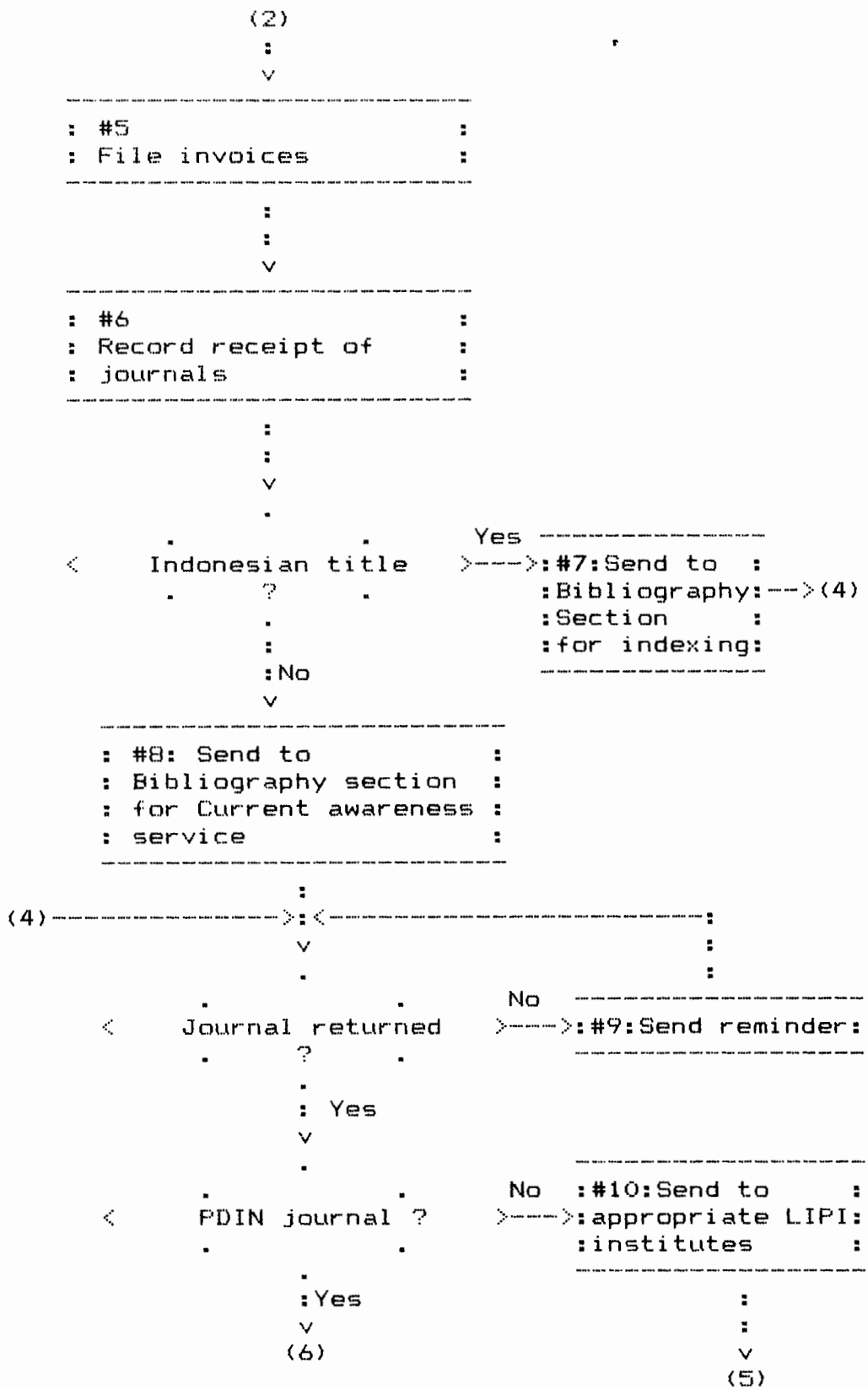
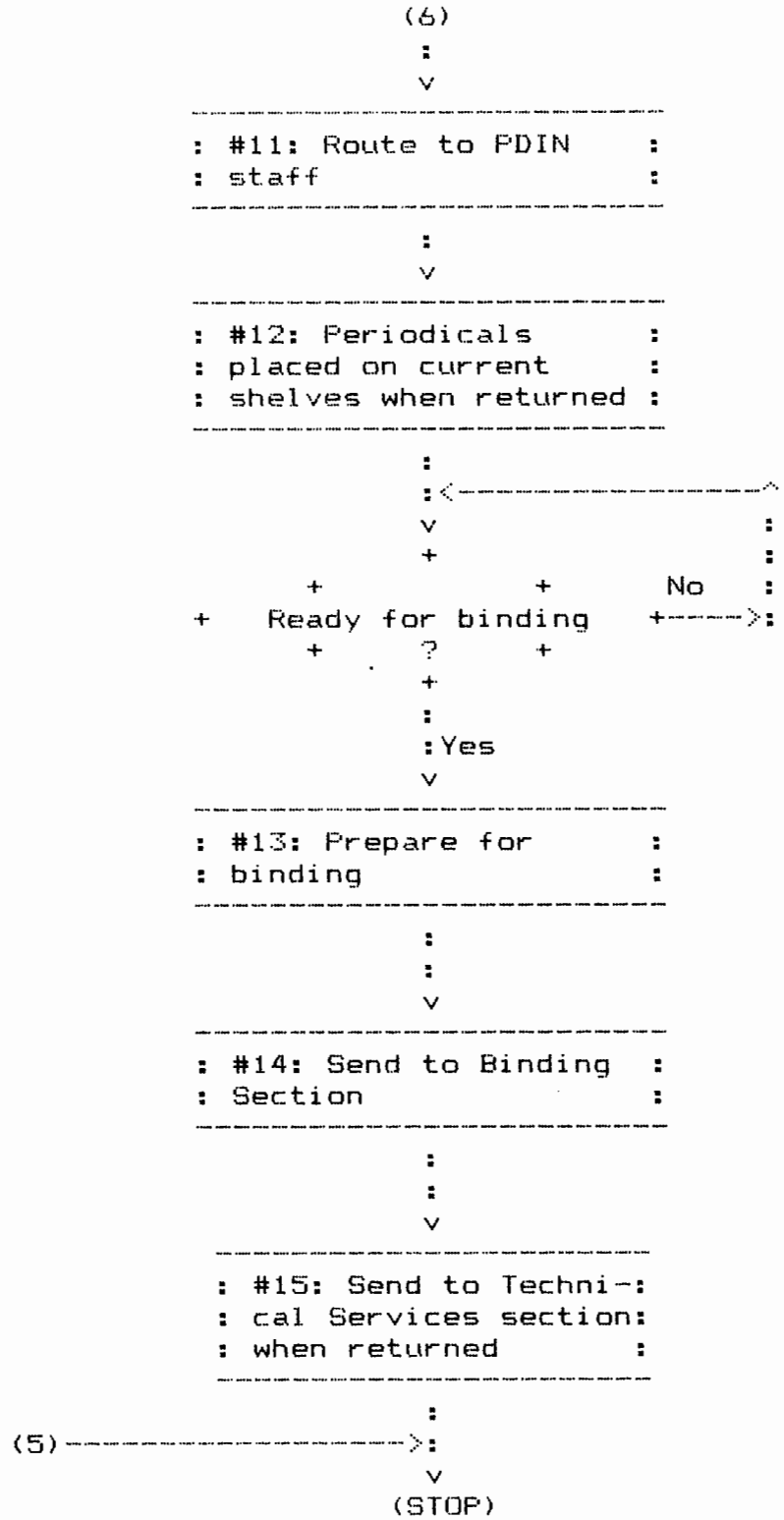


Fig. 4. Serials System (cont'd)



Automation of the Serials Section

II.13. Serials control is suitable for automation. PDIN currently receives over 1,000 titles of periodicals, of which approximately 50% are foreign subscriptions. However, serials control is one of the most difficult and time consuming tasks in the library. The current manual procedures do not contain a proper monitoring and follow up system. For example, between steps #2 & #3 in Fig. 4, there is no follow up procedure for the non-receipt of proforma invoices. Similarly, between steps #5 and #6, there is no procedure for claiming issues of periodicals which are not received. The manual procedures also make the collection of statistics and the production of daily activity reports difficult if not impossible. It should be noted that there is a considerable time lag between the receipt of a journal and the time it is made available for use because there are several potential areas of delay, including:

* Delay in the receipt of journals.
* Delay in indexing Indonesian periodicals by the Bibliography Section.
* Delay in photocopying the contents pages for the current awareness service.
* Delay in binding preparation.
* Delay in binding.
* Delay in processing journals by Technical Services section.
* Delay by staff in returning journals routed to them.

II.14. Automation will help to reduce but will not completely eliminate these delays. The consultant was told that,the Agricultural University at Wageningen has developed a serials control system for MINISIS called "Kardex". However, as PDIN did not have any documentation about the system the consultant was unable to determine whether or not this system would be suitable for PDIN. Should it be found that the Kardex system is unsuitable, it would be necessary for PDIN to develop its own serials control system, in which case a consultant may have to be appointed to assist PDIN in designing and developing the serials control system.

II.15. A serials control system should contain at the very least the following functions:

(a) Acquisitions system for serials (See para. II.4 ff).

(b) Check-in. This function represents the core function of any serials control system. The main features should include:

* Online and interactive facilities.
* User should be able to quickly match issue in hand with the appropriate record in the serials database using a search key such as the ISSN, CODEN or title.
* If issue in hand is not the one predicted, e.g. if it is a later issue than the one expected, then the system should be capable of generating a claim automatically.
* Staff should be able to override the system.

(c) Routing. Main features should include:

* Production of routing slips.

* Provision of routing review lists.

(d) Claims. Main features:

* Automatically identify issues that should be claimed.

* Produce review lists for irregular publications.

(e) Binding. Main features:

* Complete handling of binding data and related control procedures.

* Automatically produce lists of serials that are ready to be sent to the Bindery.

(f) Reports. The reporting function can be as complex or as simple as the situation warrants. But at the very minimum the system should be able to produce the following kinds of reports:

* Daily activity reports, e.g. no. of issues checked-in, no. of items claimed, no. sent for binding, no. returned from bindery, etc.

* Monthly and annual summaries of the above.

* Statistics relating to the serials data base.

II.16. The Serials Data Base. Currently, there are no universally accepted standards relating to the design of the database, although this probably constitutes the core of the serials control system. Briefly, the database can be viewed as comprising three parts:

(a) The bibliographic description. The format should be based on an approved MARC format.

(b) Data relating to serials orders.

(c) Holdings data, including data that identify the publication pattern of the serials. Several organisations are in the process of developing guidelines for recording such data. For example, three American standards are being developed or have been developed. They are:

- L.C. MARC format for holdings and locations
- Standard for recording serials holdings at the detailed level (ANSC Z39 SC E)
- ANSI standard for serials holdings at the summary level (ANSI Z39.42-1980).

In developing the serials system, an effort shuld be made to follow the standards mentioned above.

II.17. Whether or not MINISIS can be used to develop an automated serials control system containing the features and functions mentioned above would only be known when adequate documentation regarding the "Kardex" system has been received. A detailed examination must be made before a decision is taken as to whether or not to use the "Kardex" system or to develop/purchase an alternative system.

***** TECHNICAL SERVICES *****

II.18. The Technical Services section is responsible for the creation and the maintenance of the library's catalogues. Most of the procedures are still manually carried out, although data relating to Indonesian research reports are being input into the computer by the Bibliography Division (using the catalogue records produced by this section). The catalogue database has already been defined as a projected subset of the PDIN database. However, there are some deficiencies in the definition as will be pointed out in the discussion on the PDIN database (See paras. III.3ff). Before proceeding any further with the computerisation of the catalogue, PDIN should obtain the services of a consultant to review and revise the various PDIN databases and the projected subsets so as to ensure that they conform with international standards.

II.19. Fig. 5 shows a flowchart of the current work procedures in the Technical Services section. The manual procedures appear to be well thought out, and the standards followed are international ones: AACR2, ISBD, Library of Congress Subject Headings, and DDC edition 19.

Automation of Cataloguing

II.20. As stated above, steps have been taken to automate the production of the catalogue. The catalogue database has been defined as a PS of the PDIN database, but it needs some refinements and revisions to conform more closely to a MARC based standard.

II.21. The following are some suggestions for PDIN's consideration:

* PDIN should initiate discussion with the National Library of Indonesia on the possibility of developing an Indonesian MARC format. Since PDIN is more advanced in its automation activities than the National Library, it should look upon the catalogue records (especially those relating to Indonesian publications) that it is creating in machine readable form as a national resource, which can be used at some future date for national bibliography purposes. It would indeed be a shame if the records need to be "recreated" in the future by the National Library of Indonesia.

* About 60% of PDIN'S current intake is estimated to be in the English language. At the present time, the automation programme assumes that all cataloguing will be in the form of original input and done in-house. There are no plans to purchase machine readable records from abroad. However, since it is likely that many of the English language publications currently being acquired already have records in machine readable form, it may be useful for PDIN to consider purchasing MARC records from another organisation, converting these to the local processing format, and using them for cataloguing purposes. Some possible sources of these records are the Universiti Sains Malaysia (MALMARC), National Library of Australia (AMRS - Australian MARC Record Service), and the British Library (LOCAS).

* An issue that should be given priority in planning the automation of the catalogue is the form of catalogue that should be produced. Essentially, PDIN has four alternatives, viz:-

(a) Continue to produce catalogue cards.

(b) Generate computer printed book catalogues to be updated at specified intervals.

(c) Produce COM catalogues, which can be updated at specified times.

(d) Develop an online public access catalogue.

II.22. The actual form of catalogue that is ultimately selected will to a large extent be dependent upon the availability of local facilities and resources. At the present time, options (c) and (d) do not appear to be viable. Option (c) is an expensive one even if the services of a local COM bureau were available. However, as far as could be determined, there is no local COM bureau at the present time in Jakarta. The cost and problems involved in using the services of a bureau outside Indonesia would be too great to make this worthwhile. In the case of option (d), PDIN does not have sufficient computing resources at the present time to provide an online public access record. This could become a viable option at some future date. Option (a) appears to be the cheapest. But it has the great disadvantage of using the computer merely as a giant typewriter and of not making full use of the power of the computer.

II.23. On the surface then it appears that option (b) is the most suitable one - at least for the next couple of years..Consequently, it is suggested that this option be adopted until such time as PDIN acquires the requisite hardware and software resources to provide an online public catalogue.

II.24. PDIN has sufficient internal expertise to proceed with the computerisation of its catalogue. What is required is a more thorough study of the format of input, which should conform as closely as posible to a MARC based format. The comments relating to the PDIN database contained in Section III are relevant here.

Fig. 5. Cataloguing System

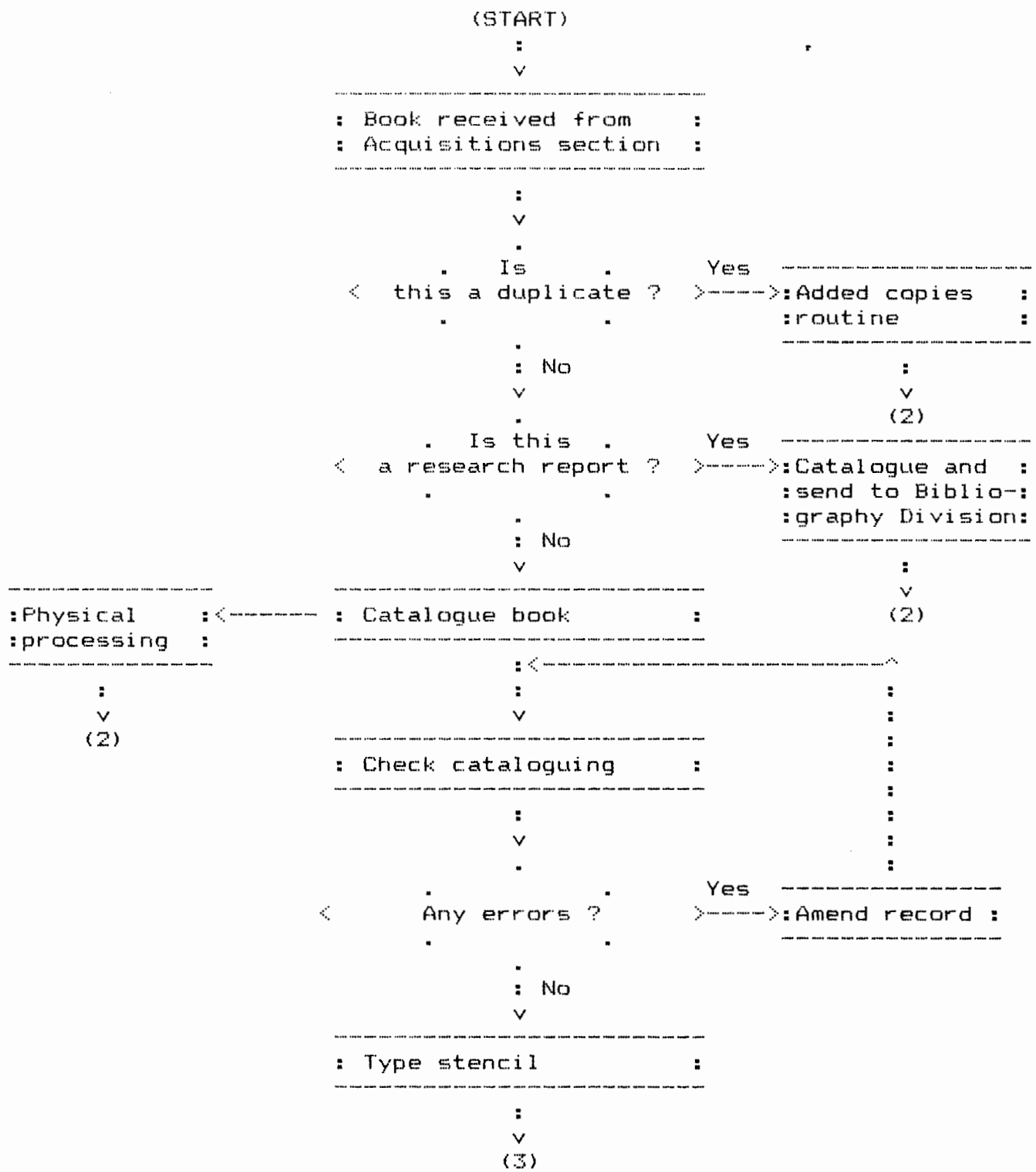
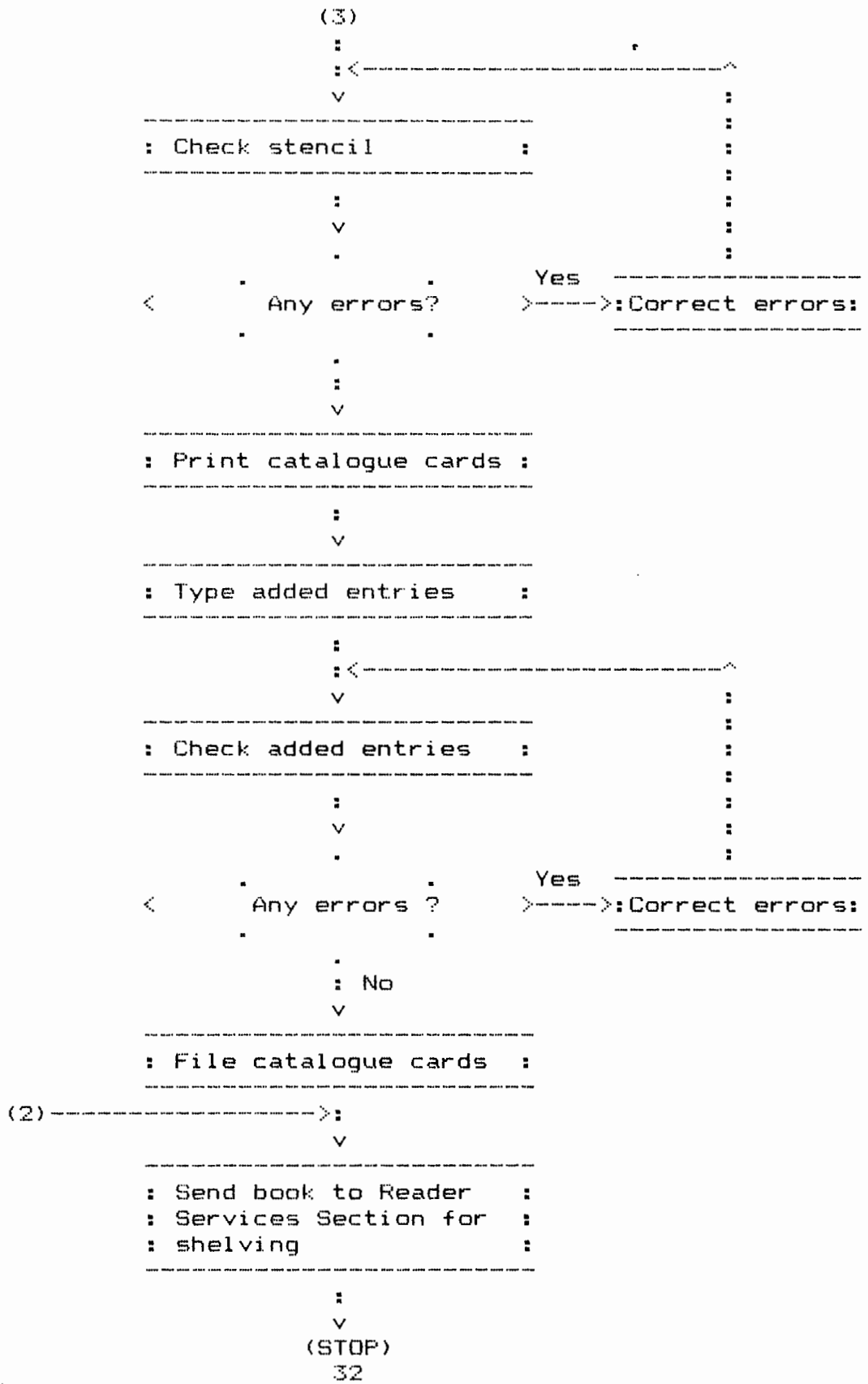


Fig. 5. Cataloguing System.



***** READER SERVICES *****

II.25. As the name implies, this section's primary function is to serve the readers of PDIN, especially members who use the library's resources and collections. According to the statistics provided in the annual report, the total number of registered members in 1984/85 was 4,756 of whom university undergraduates constituted approximately 72.6%. The figures relating to the collection were as follows:

Books & bound journals	82,318 vols.	(est. 35,000 titles)
Microfilm	1,486 titles	
Microfiche	43,032 titles	
Standards	11,346 titles	
Current periodicals	1,200 titles	(est.)

II.26. The number of loans recorded in 1984/85 were 17,341. But this figure does not reflect the actual usage of the collection. Other statistics show that on-site use totalled 169,675 books and bound journals, 532 microfilms and 39,505 issues of current periodicals.

II.27. Flowcharts of the main procedures are shown in Figs.6-11. A few comments relating to these flowcharts would be appropriate:

* Membership registration. The procedures for membership application and registration are not very complicated, but they are time-consuming and costly because of the policy that all applicants be informed by post when the membership cards are ready to be collected. This policy was apparently introduced in order to make sure that the address given by a registered member is the correct one. Nevertheless, this step appears to

be unnecessary because the identity and address of prospective members can usually be verified from the applicant's identity card (kartu penduduk) as well as by the present rule requiring the applicant to produce evidence that he/she is currently working or studying. In any case, as the majority of members are undergraduate, it may be difficult to keep track of their current addresses because of the tendency of undergraduates to change addresses frequently.

* Charging and Discharging. For every loan three files are maintained. The first is a file of book cards arranged alphabetically by the title of the work on loan; the second is a file of "Bon Peminjaman Buku". This is a record which has to be completed by the reader every time a loan is made, and contains space for the following information: name of borrower, membership no., title of book, author, accession no., class no., status of borrower, date borrowed, date due, renewal. The third record called "Catatan pinjaman" is a permanent card record containing details of every loan by a registered member. It contains the name of the borrower, the membership no., the photograph of the borrower, the title(s) of the book(s) borrowed, the date due, and appropriate notes. The records in this file are arranged by name of borrower. It can be seen from the above that the charging and discharging processes are tedious and time-consuming for both PDIN and the readers. It is clear that the manual procedures could be simplified by using a charging system such as Newark or Browne.

Fig. 6. Circulation System: Membership Registration

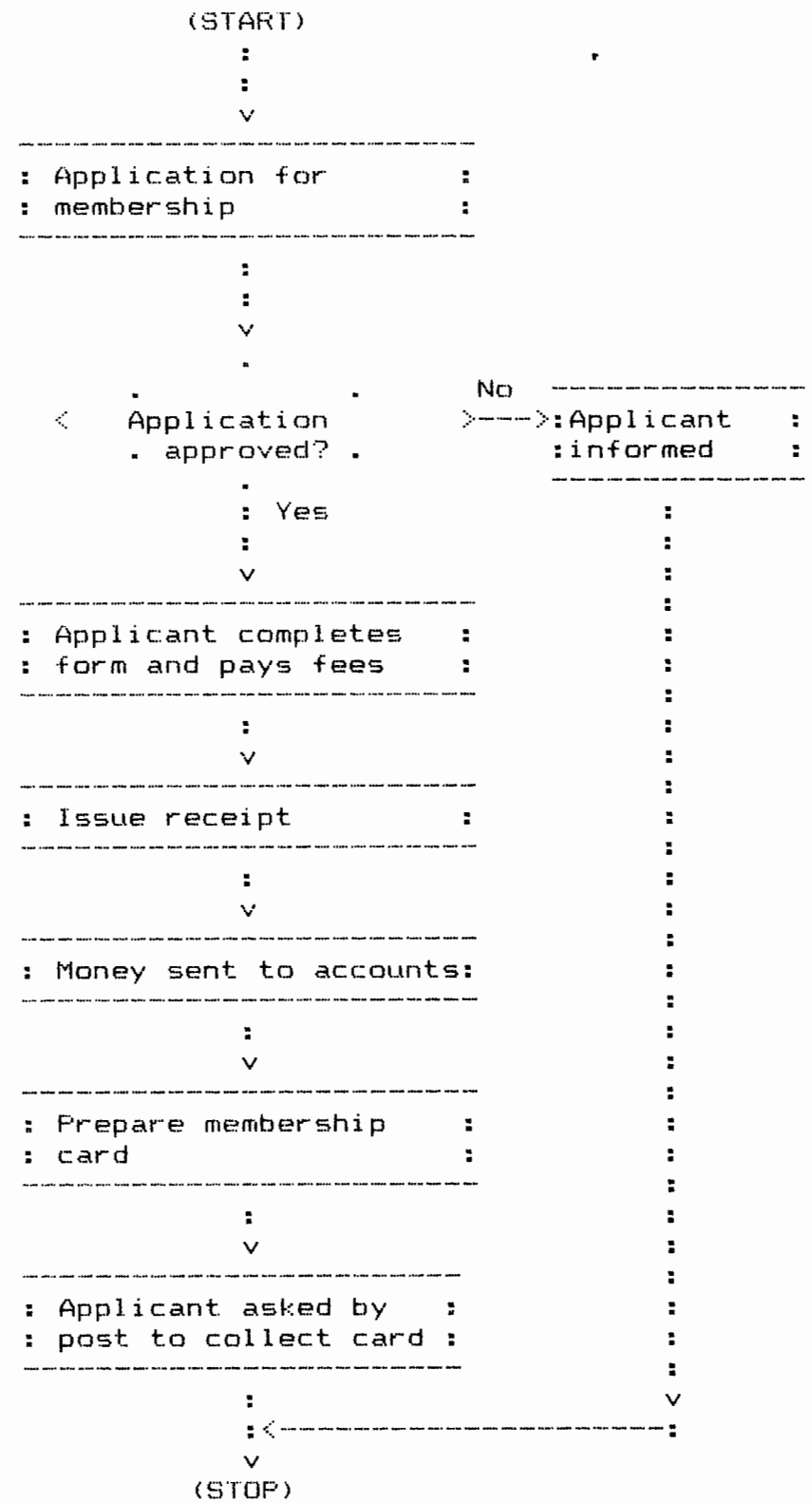


Fig. 7. Circulation System: Charging

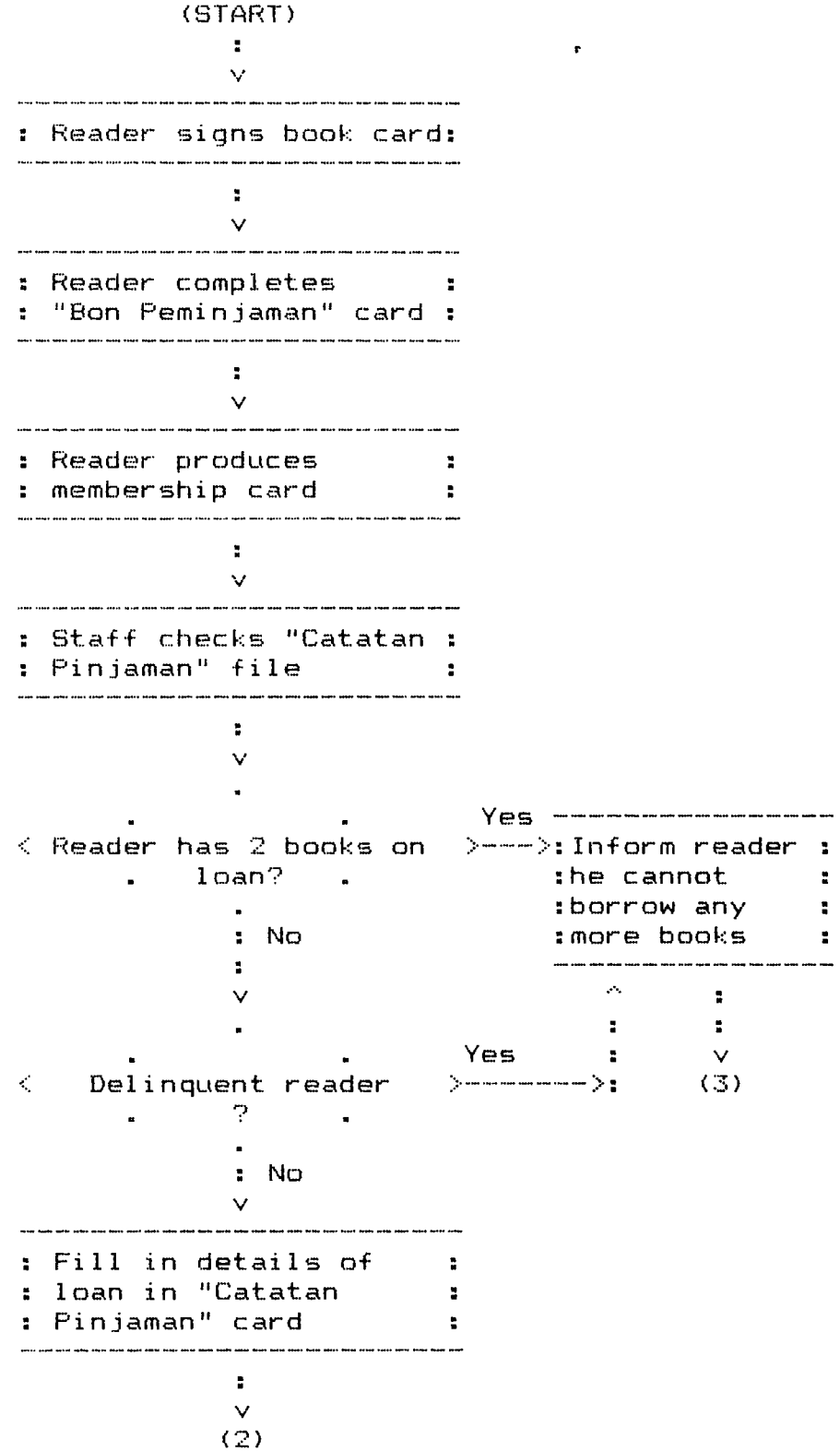


Fig. 7. Circulation System: Charging
(cont'd)

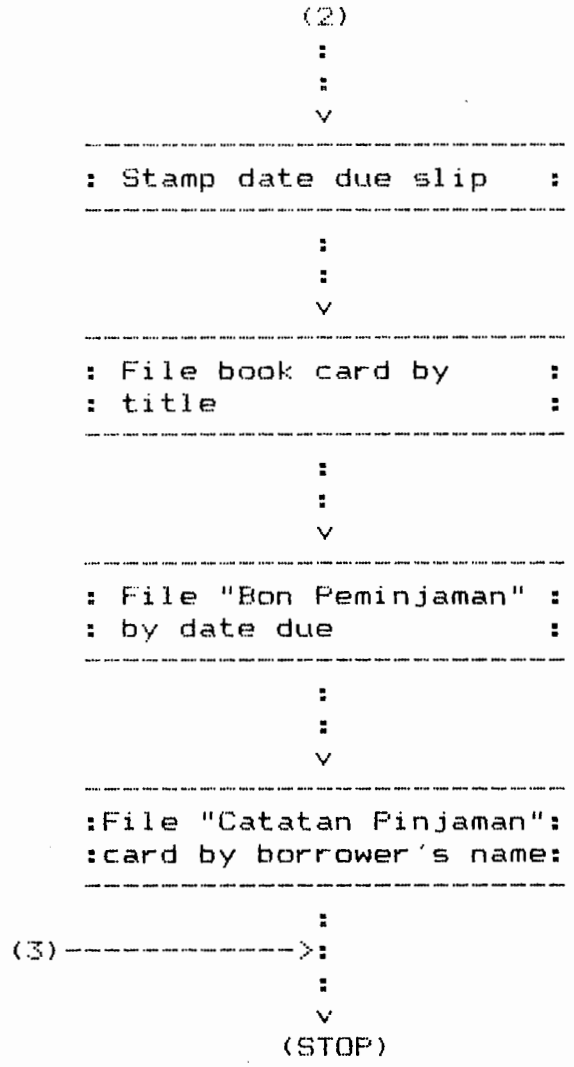


Fig. 8. Circulation System: Discharging

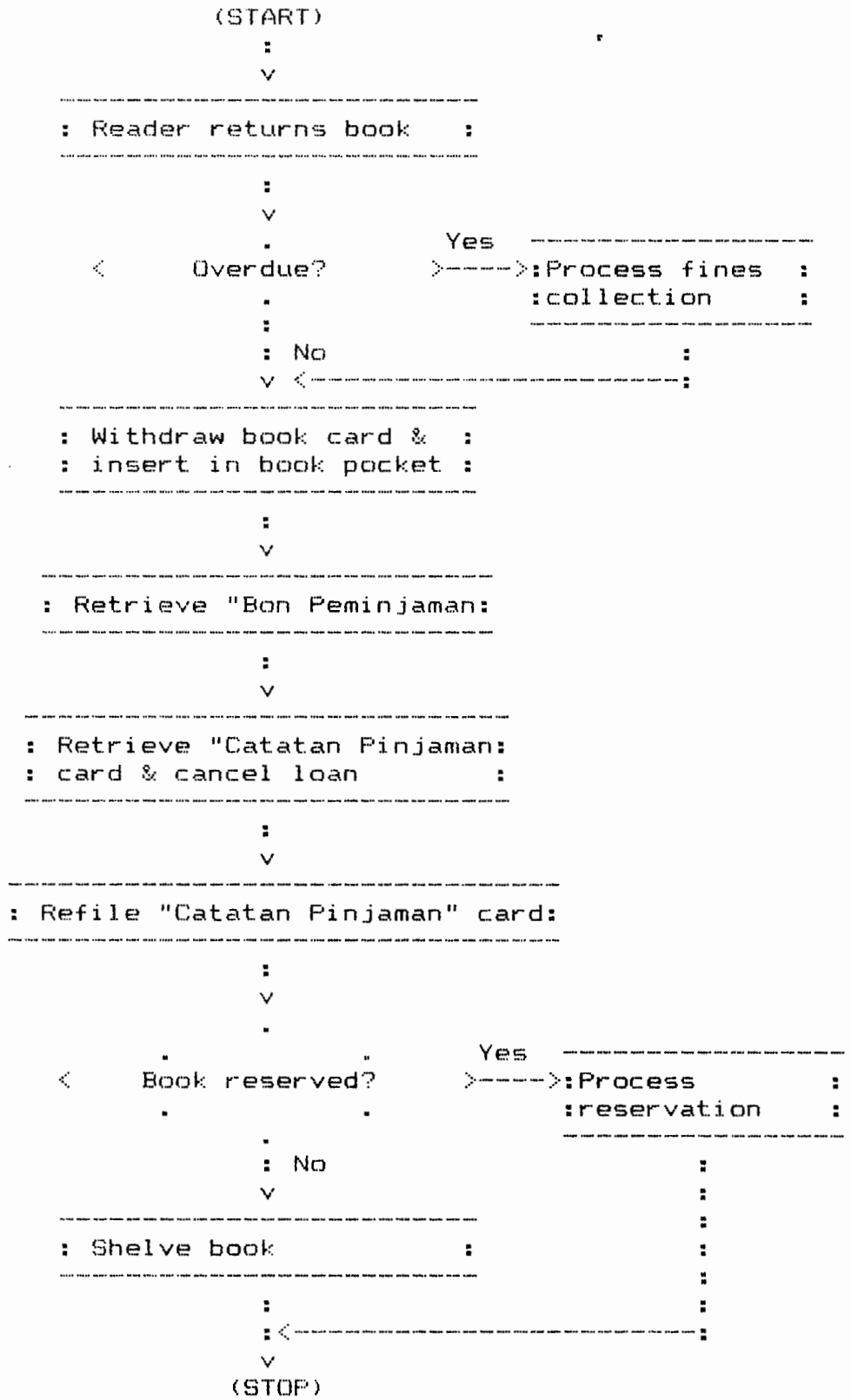


Fig. 9. Circulation System: Overdues

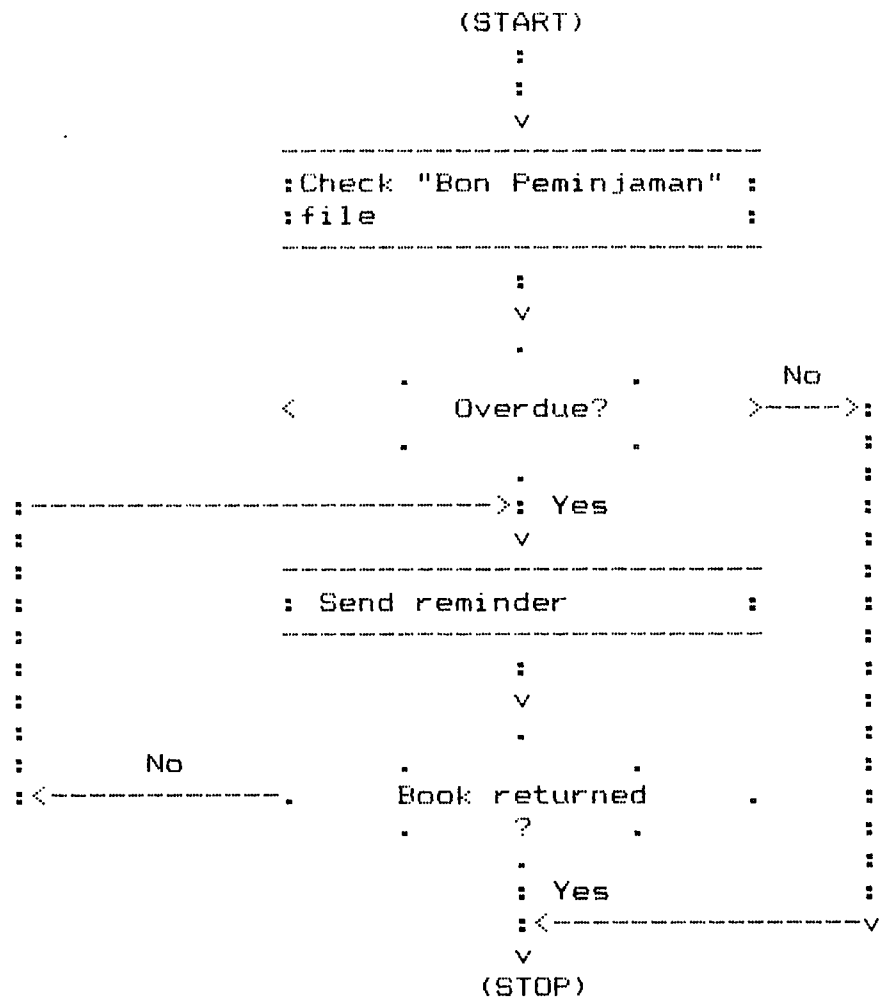


Fig. 10. Circulation System: Reservations

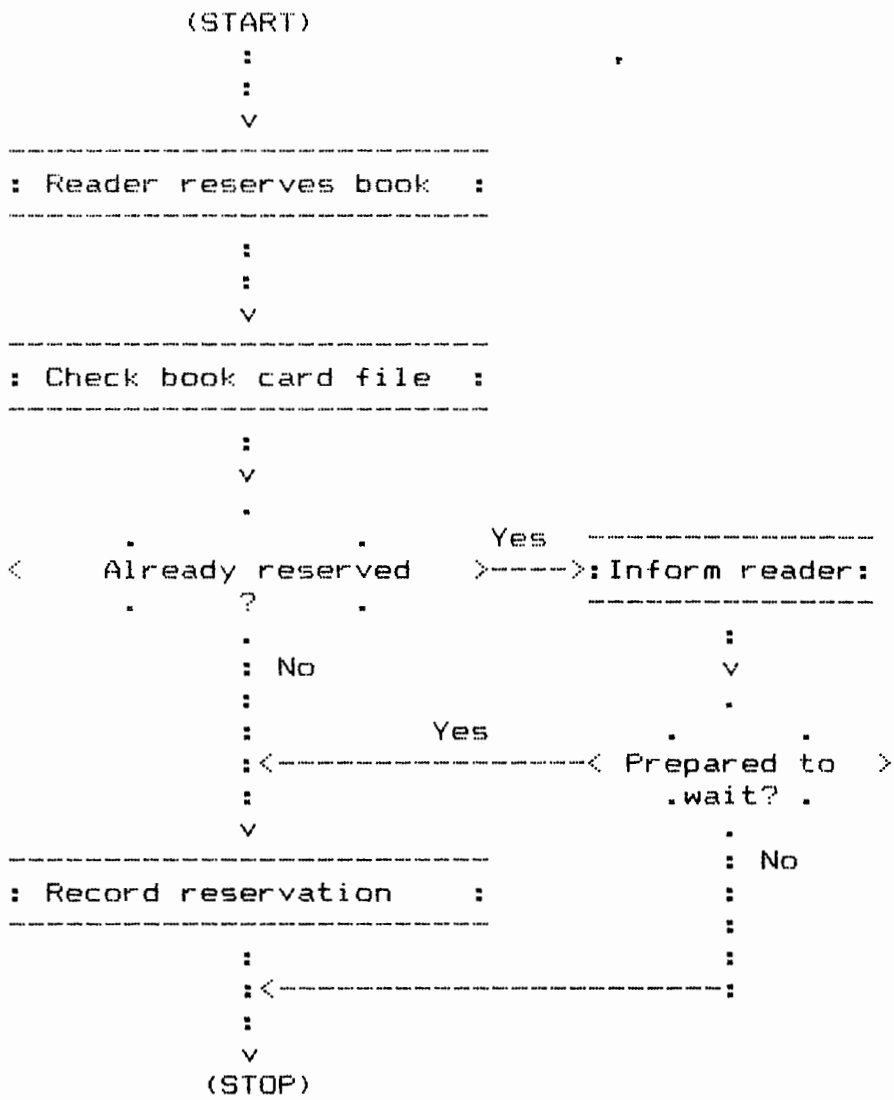
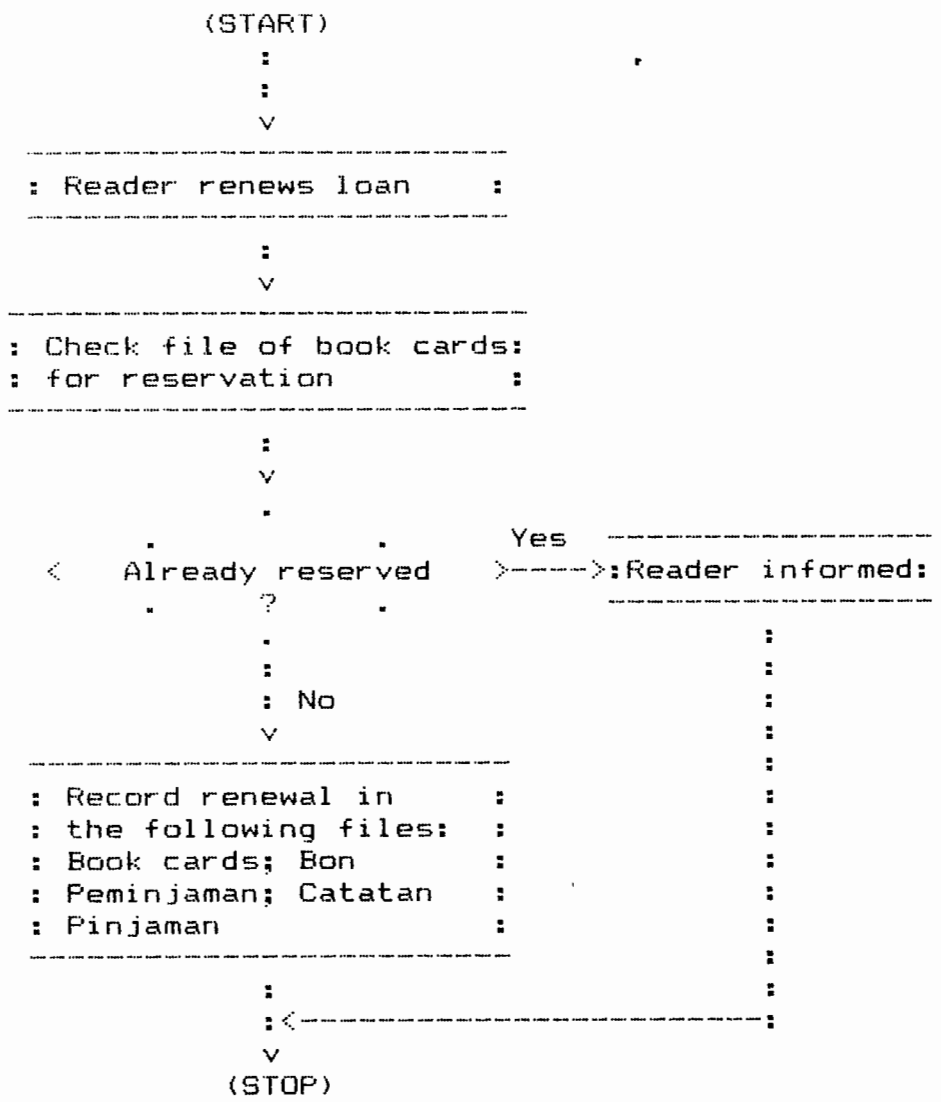


Fig. 11. Circulation System: Renewals



Automation of the Circulation Control System

II.28. On the basis of the current number of loans per annum, there does not appear to be any strong justification for automating PDIN's circulation control system. The volume of loans is small enough to be handled efficiently by manual methods, although some of the more cumbersome procedures practised could conceivably be streamlined.

II.29. Another argument against giving priority towards automation is that the MINISIS system does not yet support circulation control. Consequently, if PDIN were to decide to automate its circulation control system, it would have to develop the system on its own. This would require in-house programming and systems expertise that does not yet exist. The situation could change in a few years' time if PDIN's training programmes bear fruit. Of course, there is an alternative, which is to contract out the development of the system to an outside body. However, this would not only be expensive, but the successful implementation would be dependent on the outside organisation's familiarity with the MINISIS system in order to interface with it.

II.30. The above arguments do not imply that PDIN should not give serious consideration towards the development of an automated circulation control system at the appropriate time. Although circulation control is not a difficult or complicated function, it is highly labour-intensive and time-consuming for both staff and readers. Consequently, it tends to be given a very high priority in the automation plans of many libraries and information centres in the developed countries. Automation will not only help to speed up the

Didn't they develop a circulation module?

charging and discharging processes, but can also help to ameliorate such time-consuming activities as the handling of overdues, reservations, renewals, and the maintenance of fines and other financial records. Even more important is the fact that automation will allow the provision of accurate, reliable and timely statistical data for reporting, collection development, management, budgeting and so on. Thus although it is not recommended that PDIN should plunge immediately into automating its circulation control system, it should consider the implementation of such a system as an important plank in its computerisation programme.

II.31. In the design and development of an automated circulation control system, the following functions and features should be considered mandatory:

* Access to databases. The system should be supported by at least two data files, viz. a bibliographic file of items in the library (usually the library catalogue) and a file of membership data. Both these files should preferably be available online and be available for interactive search and retrieval.
* Charging. The system should allow the membership identification number and the item identification number to be read by means of an input device such as a bar-code reader or other applicable device. This implies that there is a means of interfacing with the library catalogue and membership file. The system should also be capable of handling exceptional

conditions, as for example, by allowing authorised staff members to override it in their dealings ,with delinquent readers, or when it is necessary for whatever reason to change the loan period or post-date a charge.

* Discharging. The system should allow a charge to be cancelled merely by reading the item identification number of the returned material. If for some reason an item has not been discharged previously, the system should be capable of allowing the item to be automatically discharged when it is charged out to another user. Again, authorised staff should be able to override the system for whatever reason.
* Renewals. The system should be capable of renewing an item for an additional loan period at the discretion of the library staff. Renewals should be possible whether or not the reader is present. Staff should be allowed to deal with exceptional cases, such as those involving reservations, recalls, limitations imposed on a reader for whatever reasons and reader delinquencies.
* Reservations. The system should be able to queue a number of reservations for the same item, and should be capable of automatically generating a notice to be sent to the reader at the head of the reservations queue. If a reserved item is not collected within a specified time, the system should automatically cancel the reservation, and issue another notice to the next reader in the queue.

* Recalls. This function is quite similar to the reservations function except that it involves a preemptive demand to return materials for whatever reasons.
* Overdues. The system should automatically generate overdue notices (possibly in batch mode). It should be able to produce a list of delinquent borrowers at specified intervals or on demand. As is normal with the other functions, authorised library staff should be able to override the system.
* Fines. When items are overdue, the system should automatically calculate the fines due and generate fines notices. If the fines are not paid, the system should produce periodic or on demand listings of delinquent borrowers. If required, the system should be capable of producing receipts for fines paid. Again, staff should have the necessary authorisation to override the system, e.g. waiving or reducing fines.
* Payment for replacement of lost items. This function is somewhat similar to that for fines, except that the amount calculated will be based on the cost of replacing the lost material as determined by library policy. In addition to calculating the amount of payment and issuing receipts, the system should also be able to recognise "lost" items which turn up subsequently and alert the staff of the need to refund the borrower concerned.
* Interlibrary loan. There should be a function to allow interlibrary loans to be processed.

* Financial records. This is essentially an accounts receivable sub-system.

* Reports. One of the main strengths of an automated circulation control system is its ability to generate all kinds of reports which are useful for management purposes. The kinds of reports that the system should be capable of generating include:

  - Daily activity summaries, e.g. items charged, discharged, renewed, reserved, etc.

  - Daily exception reports, e.g. items overdue, fines paid, bills for replacement of lost items, refunds, etc.

  - Database statistics.

II.32. It is clear that a well-designed circulation control system can go a long way towards improving the management and running of the library. Its impact on users will be very great if it cuts down on the time and labour involved in processing a loan. It will also permit the library to monitor more closely the usage of the collection, and delinquent behaviour. If properly collected the statistical data can be very useful for the management and plannning of services.

II.33. It may not be possible to design a system that will contain all the features and functions mentioned above. A proper study is necessary to ensure that whatever features are eliminated will not make the services less efficient or less effective.

SECTION III. BIBLIOGRAPHY DIVISION

III.1. The principal activities of this division include:

* Provision of information services. The division provides manpower to man the information desk where a number of enquiries are handled directly by the staff on duty. In addition, the division provides a current awareness service (which is basically a current contents service), conducts literature searches on demand, and provides a document delivery service.
* Indexing and abstracting services. The principal products include Index majalah ilmiah Indonesia (Index of Indonesian learned periodicals) and Indeks laporan penelitian dan survei (Index of Indonesian research reports). Less frequently published are the Sari laporan penelitian dan survey (basically, the same entries as the Index of Indonesian research reports, but excluding entries from documents not held by PDIN and including abstracts), Wanita Indonesia: sari karangan (Women in Indonesia: Abstracts), Indeks makalah: konferensi, lokakarya, seminar dan sejenisnya di Indonesia 1981-1983 (Index of articles: conferences, workshops, seminars, etc. in Indonesia 1981-1983).
* Translation services. This service is not actively promoted because PDIN does not have the skilled staff who can provide such a service.

* Union catalogue of periodicals. Previously published by in 1974, 1981 and 1983, the current union catalogue is being compiled by PDIN with the cooperatin of over 40 libraries and institutions. The total number of entries is expected to exceed 10,000 entries.

Automation

III.2. Of all the divisions in PDIN, the Bibliography division is possibly the most advanced where automation is concerned. This is largely because PDIN's current automation activities are mainly in the area of database creation. As details of these activities have been reported (Sudarsono, 1985), they will not be repeated here.

III.3. Many of the databases have only been defined recently and the inputting of data into them has just begun. Of major importance is a master database called PDIN, which has four Projected Subsets called KATALOG (for books), KONF (for conference papers), IMII (for journal articles) and AKUIS1 (for acquisitions data).

III.4. The PDIN database could be improved in two ways. Firstly, it would be preferable to define two RD databases - one for monographic level documents and one for analytical entries (journal articles, conference papers, etc.) - rather than to define one large database incorporating monographs, journal articles, conference papers, etc. Secondly, the format of the PDIN database could be improved through greater care being taken in the database definition to eliminate inconsistencies, and in following more closely an internationally accepted standard.

III.5. As far as the PDIN database is concerned, it is recommended that the standard followed should be as closely compatible with UNIMARC as is possible. While it is recognised that it is difficult to implement the full MARC record structure using MINISIS, it should be noted that IDRC has made some changes to MINISIS which have resulted in the creation of several generalised user exits that will allow the processing of MARC formatted records. (IDRC, Sept. 1985)

III.6. The reasons for suggesting that PDIN tries to conform to a MARC-based format are as follows:

* PDIN is one of the major national institutions in the country, and its resources constitute an important national information resource especially in the fields of science and technology. It is therefore incumbent upon PDIN to ensure that the database records that are created in the course of its operations are available for use by other institutions within the country.
* PDIN is involved in the creation of several important national databases, e.g. its Index of learned Indonesian periodicals, Index of Indonesian conference proceedings, and Index and abstracts of Indonesian research reports. These databases are valuable assets which could be used at some future date for exchange with the databases of other countries or organisations. To be useful, they should be available in a internationally accepted format, e.g. UNIMARC.

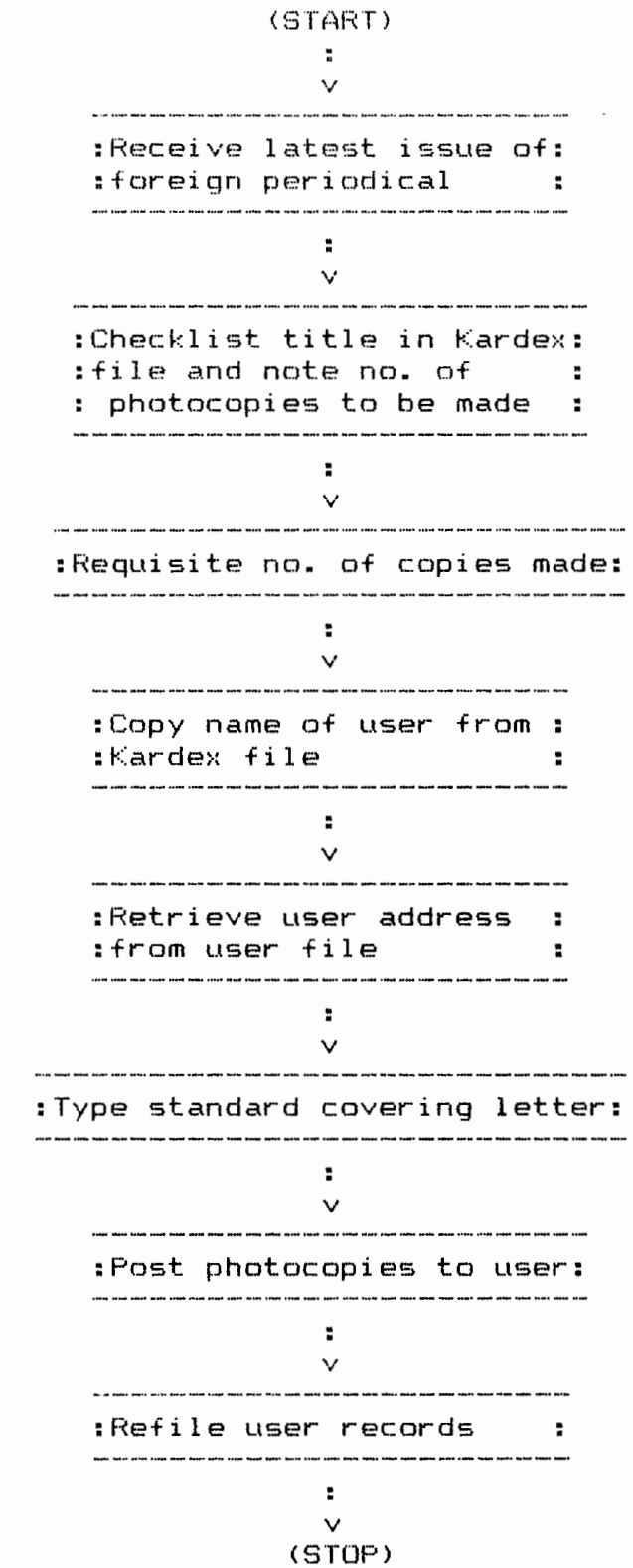
* As the only major library and information centre with expertise in automation, it is expected that PDIN will be eventually be approached to assist other institutions in developing their automated systems, and especially the automation of their bibliographic records. It would therefore be useful if more attention were paid towards the development of a national bibliographic format which could form the basis for future work.

III.7. In Appendix 2, a comparison is made between the PDIN database format and UNIMARC. It can be seen that with only relatively minor modifications, it would be possible to create a format that is quite compatible with the UNIMARC format.

III.8. At the time of the consultant's visit only the Sari karangan laporan penebitan, vol. 9 and the Sari karangan wanita, vol.3 had been output from the database. Since these two publications are peripheral to the principal bibliographic activities of PDIN, it is suggested that greater attention be paid towards speeding up the production of the Indeks majalah ilmiah Indonesia and the Indeks laporan penelitian dan survei.

III.9. Current awareness service. This service is still being provided manually. Fig. 12 illustrates the processes involved in providing such a service - essentially a current contents page service. This activity is very labour intensive, and as there are currently over 1,000 end-users the work involved in monitoring the receipt of the appropriate periodical titles and matching these titles against the correct users is very time-consuming. It is also difficult to keep track of subscription payments by users. Two sets of files need to be kept. One is an alphabetical file of titles in which titles received from the Serials section are checklisted (thus duplicating the checklisting activity already carried out by the Serials section). Against each title in this file is recorded the name of users interested in receiving photocopies of the contents pages of the journals concerned. The second file is an alphabetical one of users. Each record contains the name and address of the user as well as a list of the titles of which he/she would like to receive the contents page.

Fig. 12. Current Awareness Service



III.10. The current awareness service is obviously a prime candidate for automation. It must be linked to the serials control system so that the current practice of recording the receipt of current (foreign) journals twice is eliminated. It would not be too difficult to design a system whereby a notice is generated indicating the name(s) of individual(s) to whom a copy of the contents page of a particular journal should be sent whenever a new issue of that journal has been received and checklisted. It would also not be too difficult to monitor and maintain a list of users subscribing to the service in the automated system.

III.11. While automating this system would not be too difficult, a fundamental question needs to be asked, viz. whether or not such a service is worth continuing. There is no doubt that the service is a popular one. However, its effectiveness and usefulness has not been measured. There are two limitations to the service:

* Coverage is limited to those titles subscribed to by PDIN and other LIPI institutions. Whether or not the number of titles provided is adequate is not easy to determine.
* Since many of the titles are not owned directly by PDIN, requests for photocopies would have to be redirected to the institutions holding the titles concerned. This means that the claimed advantage that requests for photocopies can be fulfilled rapidly may not apply.

III.12. The question that needs to be asked is whether or not an alternative kind of current awareness or SDI service based on user profiles and access to external databases would be more effective and useful. The advantages of such a service are that there is a greater

range of titles covered and that more relevant and unique subject coverage can be made available to every individual user. Against this would be the argument that while users' attention may be drawn to a larger number of relevant documents, the non availability of these documents in either PDIN or other institutions in Indonesia would militate against the usefulness of the service. Furthermore, to develop accurate user profiles is no easy task, and this fact combined with the large number of potential users may require far more expertise and manpower than PDIN currently possesses.

III.13. Literature search service. PDIN provides a literature search service on demand. Fig. 13 shows the procedures involved in this service. Currently all the literature searches are undertaken manually within Indonesia. External searches are mainly done in batch mode using the services of institutions such as the Australian National Library, CSIRO in Australia and SEAMIC in Tokyo, Japan.

III.14. The technology to access external bibliographic and other databases already exists in Indonesia. Subscribers can be connected using one of three methods:

* Using a dedicated circuit to connect to the packet switching network.
* Using the Public Switched Telephone Network (PSTN).
* Using the telex network.

Fig. 13. Literature Search Service

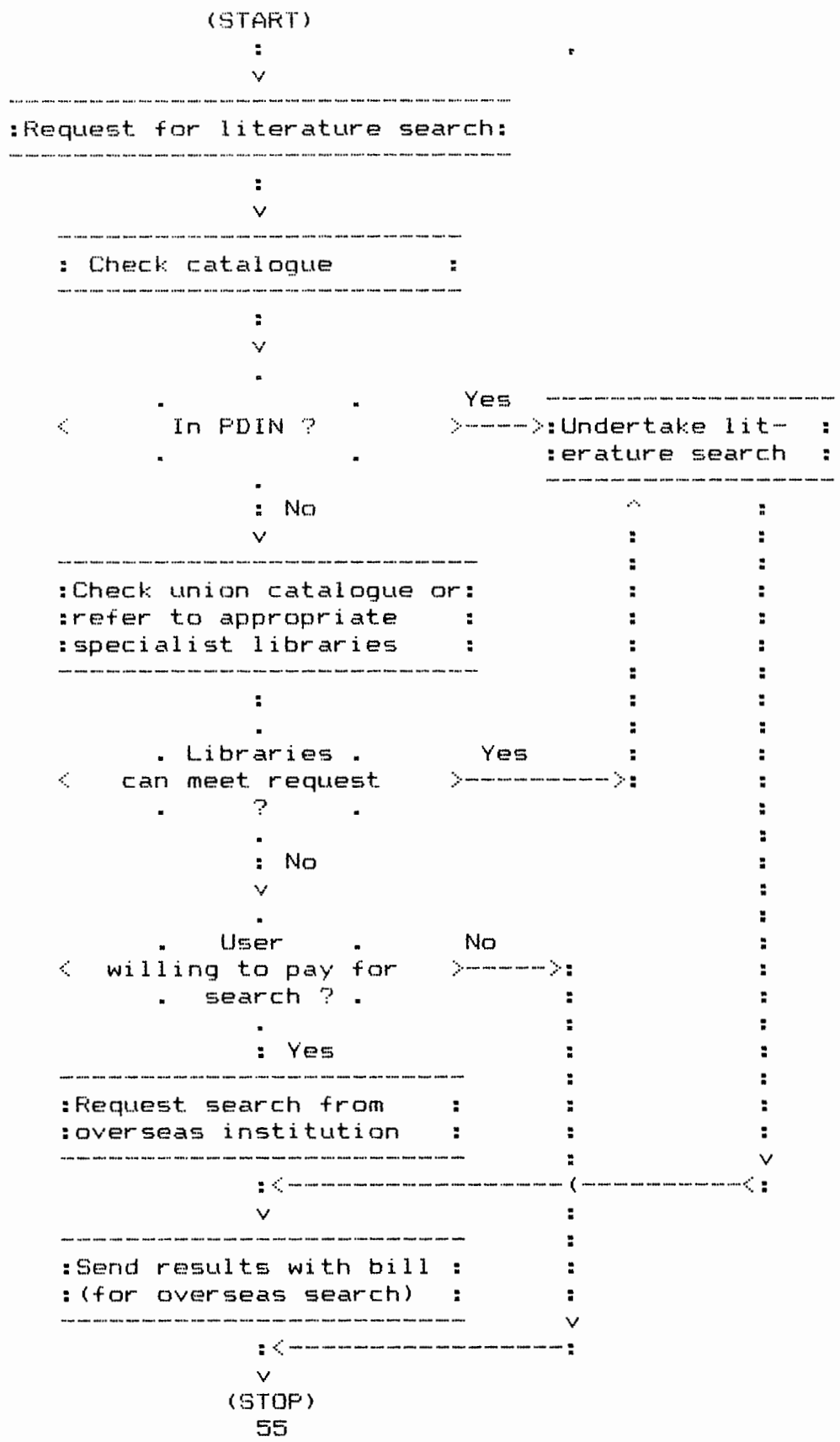


Table 1. Telecommunications Charges for Data Access

Description	Dedicated Line	PSTN
Installation (One time charge)	Rp 250,000	Rp 50,000
Monthly fixed charges:		
Local line fee	200,000	-
Fixed monthly cost	125,000 (1200 bps) 250,000 (2400 bps) 475,000 (4800 bps)	50,000 (300 & 1200bps)
Network Interface Unit	-	10,000
Rental for modem	85,000 (300 bps) 130,000 (1200 bps) 200,000 (2400 bps) 300,000 (4800 bps)	85,000 (300 bps 130,000 (1200 bps)
Variable charges:		
Duration charge/min. (Domestic)	50	50
Duration charge/min. (International)	US$0.25	US$0.25
Volume charge per segment (64 bytes) (Domestic)	5	5
Volume charge per segment (64 bytes) (International)	US$0.015	US$0.015

N.B. US$1.00 = approx. 1000 Rp.

III.15. The telex network is very slow (being only 50 bps) and can therefore be discounted as a method of access. PDIN possesses two microcomputers - an Apple compatible and an HP microcomputer - which can be used to access the external databases such as DIALOG, BRS or SDC Orbit, if these microcomputers have the necessary communications software and a modem connected to the serial port.

III.16. Unfortunately, however, the telecommunications charges, as shown in Table 1 above, are relatively high so that it is difficult to justify the provision of such a service unless there is a very wide user base that can generate sufficient revenue to support the service. Furthermore, the general lack of documentary resources in the country could militate against the effectiveness of the service. It is felt that there would be no point in generating a large number of bibliographical references if these are not readily available in the country. On the other hand, studies by the British Library Lending Division (BLLD) have shown that the lack of library resources within a country is not necessarily a disadvantage if the country concerned has access to the services of an international interlending institution such as the BLLD. In fact, in many cases the interloan services provided by institutions such as the BLLD are frequently faster than those provided by institutions within a country. To resolve the questions raised above, a pilot project to establish an online link with an external information service like DIALOG is suggested. (See IV.9 for details).

III.17. Document delivery service. PDIN also provides a documentary delivery service that is quite popular. According to the statistics provided to the consultant, about 42% of the document requests are supplied from PDIN's own literature resources, 21.5% from other libraries in Indonesia and 36.5% from overseas institutions. The major problem in the provision of this service appears to be trying to collect payments from users for photocopies supplied. Currently, it is difficult to keep track of non payments. But attempts are being made to computerise the billing system so that there is a closer monitoring of unpaid bills.

III.18. Union Catalogue of Serials. PDIN has been using the computer of the Departemen Pekerjaan Umum dan Tenaga Listrik since 1975 to produce the union catalogue of serials. However, the latest effort involves using the MINISIS system, and a database has been defined for the union catalogue. It is suggested that PDIN reviews the format of this database, and considers the possibility of defining a format that can be more readily converted into a MARC compatible format should this be required.

36.5% overseas. (meaning what? - Asian or mainly N.A./BRIT.?)

SECTION IV. RECOMMENDATIONS.

RECOMMENDATION 1: IN-HOUSE SYSTEMS DEVELOPMENT

IV.1. The development of an integrated computerised library and information system is no easy task. Essentially, PDIN has two alternatives, viz.:

* Develop an integrated system using MINISIS. This is not an impossible task, since MINISIS has many powerful features, and skilled programmers using SPL or some other high level programming language would be able to develop systems that can interface with the databases created using MINISIS. Furthermore, some MINISIS users have already developed systems which are available for use by other users.
* Purchase an integrated library package such as VTLS (Virginia Tech Library System) which can run on the HP 3000 system. This is a costly option, and but has been adopted by some institutions as an effective solution because of the general difficulty of adapting MINISIS for purposes other than information storage and retrieval. Furtheremore, this option (although costly) may in the long run prove to be economical because it does not require the type of skilled programming and systems personnel that would be needed to develop new systems.

IV.2. In the case of PDIN, the alternative of acquiring another integrated software package is not a viable one because of the lack of financial resources, and because quite a lot has already been invested in the MINISIS system. It is therefore assumed that for better or for worse, PDIN's integrated computerised library system would have to be based on the MINISIS system.

RECOMMENDATION 2: AUTOMATION PRIORITIES

IV.3. In Sections II and III of this report, a number of guidelines have been provided with respect to the automation of the various activities of PDIN. They will be referred to in the appropriate recommendations that follow. It is quite obvious that to be effective a planned programme of automation should be implemented. The schedule that is suggested below is based on three factors:

* The importance of PDIN's bibliographic activities.
* The national role of PDIN in the information field.
* The in-house expertise that exists currently.

IV.4. The schedule for implementing the various automation activities of PDIN should be as follows:

Year 1

1. Bibliography Division.
2. Technical Services Section.
3. Assistance to the National Library of Indonesia.

Year 2

4. Acquisitions Section.
5. Serials Section.

Year 3

6. Reader Services Section.

RECOMMENDATION 3: BIBLIOGRAPHY DIVISION

IV.5. The priority given to automating the activities of the Bibliography Division is in keeping with PDIN's own set of priorities. This is logical since PDIN's principal function is to provide scientific and technical information to researchers and others in the

country, and this function is actively supported by the activities of the Bibliography Division. Guidelines for the automation of the Bibliography Division are provided in paras. III.2 - III.18. The major recommendations are as follows:

(a) Reexamine the PDIN database with a view towards eliminating inconsistencies, and if possible, follow more closely a MARC based format.

(b) Create two master (RD) databases - one for monographic items and the other for indexes and abstracts.

(c) Greater attention should be paid towards speeding up the production of Indeks majalah ilmiah Indonesia and Indeks laporan penelitian dan survei.

(d) Reexamine the need to continue with the current awareness service in the present form.

(e) Launch a pilot project to establish an online link with external information services.

IV.6. Recommendations (b) and (c) are self-explanatory and need no further amplification. In the case of (a), some of the deficiencies have already been mentioned. Many of the databases appear to have been hurriedly created, and as a result some inconsistencies exist. A few examples will suffice (database names in upper case):

* Field length for Conference name in KATALOG is 300 characters but only 200 in PROCEED.
* Length of address field in SUPPLIER is 150 characters, but the total length of the subfields is 300 characters.

* Conferences are not treated as corporate bodies, and consequently there is no coded link with an authority file as is the case for other types of corporate bodies.
* The length of many fields appear to have been arbitrarily decided upon. It is suggested that a sample of the catalogue entries be taken in order to determine the appropriate length of such fields as personal author, corporate body, title, etc.

IV.7. The need to adopt a MARC based format has also been stressed and the reasons giving for doing so have been outlined in Section III of this report. The creation of machine readable data has long term implications for PDIN and Indonesia. The databases so created can be used not only to produce bibliographies to support PDIN's activities, but as they grow in size and importance they can be used to provide current awareness or SDI services in the future. There is also a possibility that they will be made available online for the use of the scientific and research community. Finally, an internationally accepted format will have the benefit that the data can be shared with other institutions, and even used for exchange with other countries.

IV.8. Apart from the bibliographic publications, PDIN also provides a current awareness service based on the contents pages of the periodicals that LIPI institutions subscribe to. The usefulness of this service and other issues are discussed in paras. III.9 - III.12. While this service can certainly be automated without too much difficulty, it may be that alternative services which are less labour intensive are more effective. The first alternative would be to

subscribe to Current contents and allow scientists and researchers access to this publication. The second alternative which is related to the topic to be discussed in para. IV.9 below would be to examine whether or not a SDI service is more effective and useful.

IV.9. Literature search service. It has been mentioned that the telecommunications facilities now allow access to external information services in the U.S.A., Europe and Australia. In spite of the fact that this service is relatively expensive, PDIN should seek external funding to launch a pilot project to study the feasibility of providing an online information retrieval service as well as a SDI service for the scientific community. The objectives of the pilot project are:

* To examine whether an SDI service can be economically provided as an alternative to the present current contents page service.
* To investigate the usefulness of an online retrieval service in the Indonesian context. This implies two things: firstly, whether or not there is sufficient demand from scientists and researchers for such a service; and secondly, whether or not the lack of documentary resources to support the service would prove to be a handicap.

IV.10. It is suggested that the pilot project be run for a period of 15 months, and be extended to no more than 50 members of the scientific community. During the pilot project period, access to external databases will be via the Public Switched Telephone Network using one of the two microcomputers that PDIN already posseses. If

funds permit, the service should also be supported by a free document delivery service. Questionnaires have to be designed to obtain feedback from scientists and researchers as to the value of the service.

IV.11. The pilot experiment will be fairly expensive. An estimate of the costs is provided in Table 2 below.

Table 2. Pilot Project to Access External Information Services

Description	Est. cost in US$
Installation	50.00
Fixed monthly charge (15 months at US$50.00)	750.00
NIU (15 months x US$10.00)	150.00
Rental for 1200bps modem (15 months x US$130.00)	1950.00
Telecom charges per search (est. US$5.00 x 600)	3000.00
Database access charges (US$25.00 x 600)	15000.00
Serial communications card	
Apple compatible	100.00
HP micro (Serial port already provided)	-
Communications software	
Apple	150.00
HP micro	200.00
Document supply (est. 15000 sheets x US$0.50)	7500.00
Total (Apple compatible) = US$28,650.00	
Total (HP micro) = US$28,600.00	

RECOMMENDATION 4: TECHNICAL SERVICES SECTION

IV.12. This section should be read in conjunction with paras. II.20-II.24. The major recommendations are:

(a) The database defined should conform to a MARC based format.

(b) As a temporary measure, the catalogue should be produced as a computer printout and updated at regular intervals. The ultimate aim would be to install an online public access catalogue.

(c) Consider purchasing MARC records.

IV.13. With respect to recommendation (a), the comments regarding the need to reexamine and revise the PDIN database are relevant. There is an urgent need to develop a national MARC format in view of PDIN's central position among information centres.

IV.14. The cost of computer paper to produce the catalogue annually would not be prohibitive, but the cost would mount as more and more machine readable records are added to the catalogue database. Assuming that 5,000 titles are catalogued annually, the cost for the first year would be as follows:

	US$
1st quarterly issue (1250 records; 125 p. x US$0.02)	2.50
2nd quarterly issue (2500 records)	5.00
3rd quarterly issue (3750 records)	7.50
Annual cumulation (5000 records)	10.00
Total	US$25.00

As can be seen from the above calculation, the cost of paper printouts would nearly double each year. Consequently, it is important that PDIN

does not continue with paper printouts for too many years.

IV.15. With respect to the purchase of MARC records from an external source to reduce the cost of original cataloguing, it is suggested that PDIN should study the feasibility of doing this. There are two questions that need to be resolved. The first is a technical one, viz. whether or not it would be easy to convert the MARC records to the format that PDIN has adopted using MINISIS. The second is a cost benefit one, that is whether the records that are obtained from external sources would be of a higher quality and cheaper than records produced within PDIN.

RECOMMENDATION 5: ASSISTANCE TO THE NATIONAL LIBRARY OF INDONESIA

IV.16. The National Library has plans to automate the national bibliography, but it will be some time before it will be able to do so, since details of the World Bank loan are still not available. Because of the National Library's involvement in the SEAPRINT Project, and PDIN's role as the Coordinator of the NLDC-SEA Consortium, it is essential that PDIN provides the National Library with the necessary assistance to automate its national bibliography.

IV.17. The first thing that needs to be done is to define a national MARC format; the second step would be to define a format using MINISIS that is as close as possible to the national MARC format. In this way, when the National Library acquires its own computer system, it would be able to convert the national bibliographic database from MINISIS back to a MARC based format.

IV.18. Once the relevant MINISIS database has been defined, the inputting of data should be undertaken by the National Library staff.

There are three alternatives available:

(a) Establish an online link with the PDIN computer using a dedicated line. This can be a very expensive option.

(b) Key in the data on to 5.25" diskettes using an HP microcomputer located at the National Library, and then transporting the diskettes to PDIN for uploading to the HP3000. The data can then be batched into the national bibliographic database using the batch-in processor of MINISIS.

(c) Acquire an additional terminal to be located at the PDIN computer centre for the use of the National Library staff. The staff would then be required to go to the PDIN at regular intervals to keypunch the national bibliographic data.

IV.19. Since the first option would be too expensive at the present time, it is recommended that either the second or third option be adopted. PDIN would naturally prefer the third option, although this would mean finding some space in the computer centre for the National Library's terminal. On the other hand, it would be to the National Library's advantage to choose option (b), because this would mean that it could have full time access to a microcomputer that it could use for other purposes. Furthermore, the HP terminal acquired would be of no use to the National Library if it were to acquire a computer system in the future that is not compatible with the HP3000 system.

IV.20. Of course, it is not expected that the National Library would get to use the PDIN facilities free of charge. Payment should be imposed for the services of staff involved in assisting the National Library and for the use of consumables and the HP3000 computer. It is suggested that the actual charges be subject to negotiations between the National Library and the PDIN.

IV.21. Cooperation between the National Library and PDIN would bring benefit to both institutions as well as to the country. The ability to share data would not only improve PDIN's bibliographic products, but would also improve the coverage of the national bibliography.

RECOMMENDATION 6: QUALITY OF PRINTED OUTPUTS

IV.22. It is proposed that the computer generated bibliographies and indexes be reproduced by making paper or aluminium plates from the computer printouts, and then running off the plates to produce the requisite number of copies. Although PDIN has a daisy wheel printer, it is felt that the quality of the printout is not adequate. Unfortunately, however, attempts to provide an asynchronous link from the HP3000 to the Compugraphics composing machine have foundered through lack of funds. The latest quotation received is in the region of US$20,000.00 whereas PDIN has only allocated US$7,500.00 for this link. There are two alternatives available to PDIN. Firstly, it can seek more funds either from the Government or from a donor agency to allow it to establish this async link, or it can look for an alternative method of producing quality printouts. One possible solution would be to acquire a HP Laserjet Plus printer, when this becomes available in Indonesia. The cost of such a printer should be between US$4,000.00 and US$5000.00.

RECOMMENDATION 7: ACQUISITIONS SECTION

IV.23. Guidelines for automating the acquisitions procedures are contained in paras. II.4 - II.10 of this report. The major recommendations are as follows:

(a) Design certain important databases, e.g. current orders file, orders history file, financial data file, vendor or supplier file.

(b) If possible, orders should be output on standard 3" x 5" multiple-part order forms (ANSI standard Z39.30 - 1982).

(c) Design a system that would include procedures for receiving items, receiving invoices, claiming, and generating management reports.

RECOMMENDATION 8: SERIALS SECTION

IV.24. Detailed recommendations relating to serials automation are provided in paras. II.13 - II.17 of this report. The main recommendations are:

(a) Obtain documentation about the KARDEX system.

(b) Compare features and functions of KARDEX against the desirable features and functions detailed in paras. II.13 - II.17, i.e. acquisitions, checklisting, routing, claims, binding, and reports.

(c) If the KARDEX system is found to be suitable for PDIN's use, it would be wise to adopt the system, otherwise, it may be necessary to develop a system using the services of a consultant.

(d) International standards should be adopted in designing the serials database. The bibliographic data should conform to

a MARC based format while the holdings data should follow one of three possible standards, viz.

- LC MARC format for holdings and locatins.
- ANSC Z39 SC E: Standard for recording serials holdings at the detailed level.
- ANSI Z39.42 - 1980: ANSI standard for serials holdings at the summary level.

RECOMMENDATION 9: READER SERVICES SECTION

IV.25. Circulation control should be the last system to be automated mainly because the volume of loans currently do not justify the introduction of automation. Details relating to the desirable features of an automated circulation control system are provided in paras. II.28 - II.33. The main recommendations are:

(a) While there is no justification for automating circulation control, efforts should be made to streamline the current manual procedures because they are too cumbersome and involve too much form filling by the readers and require the maintenance of too many files by the staff.

(b) Desirable feature/functions of a circulation control system include: Access to relevant databases, Charging, Discharging, Renewals, Overdues, Fines management, Payment for replacing lost items, Interlibrary loans, Financial record keeping, and various types of management reports.

(c) At the present time, MINISIS does not support circulation control. Consequently, it may be necessary to develop a system from scratch.

RECOMMENDATION 10: DEVELOPING IN-HOUSE EXPERTISE

IV.26. It is all very well to recommend that various operations of PDIN be automated, and to provide some guidelines regarding the desirable features and functions. But PDIN should also be provided with some advice as to how to go about implementing the various recommendations. In Recommendation 1 it is suggested that PDIN has no choice but to try to develop the various systems using MINISIS. The question that needs to be decided is how much of this development should be done in-house and how much of it should rely on the expertise of outside technical consultants.

IV.27. The strategy to be adopted by PDIN should be to rely as much as possible on its own in-house expertise and to use consultants only if it has no other choice. This approach suggests that PDIN should make serious efforts to strengthen its internal expertise by devising a planned programme of training not only for the staff of the computer centre but also for the staff in the various divisions and sections.

IV.28. PDIN currently possesses a team of three persons who have attended the MINISIS training courses. Two of these have also attended the HP systems manager's course. However, it does not possess anyone who has programming experience and skills, nor does it possess any systems staff with the requisite experience and knowledge to develop library and information systems.

IV.29. Early this year, Mr. Petra Nusantara, a member of the PDIN computer centre, was sent to the Asian Institute of Technology in Bangkok, Thailand, to pursue a diploma programme in computer science.

However, it will take some time for Mr. Nusantara to acquire the necessary programming skills and experience after graduation before he can make a significant impact on the computerisation programme of PDIN. PDIN should therefore view its training programmes to build up its expertise in the areas of systems analysis and programming as a long term one.

IV.30. With respect to the other staff in the computer centre, it is suggested that both Mr. Lasijan and Mrs. Nurasih be sent for formal training to equip them with the requisite professional skills. Because of language constraints, Mr. Lasijan should be sent to a local university or institution of higher learning; but Mrs. Nurasih could be considered for training abroad. No recommendation is made with regard to Mr. B. Sudarsono, the head of the Library Division as well as the computer centre because the consultant understands that he will be proceeding to undertake doctoral studies at the College of Librarianship Wales either in 1986 or 1987. If there are plans to send Mr. Sudarsono to Wales, immediate steps should be taken to find a replacement who could also provide effective leadership in PDIN's computerisation programme.

IV.31. Apart from the computer staff, efforts should also be directed towards providing some training for the staff of other sections and divisions. The heads of sections should be given some priority; and training could be in the form of attendance at short term courses, attachments at relevant institutions, and training leading to formal qualifications in information science. The immediate

need is to send Mrs. Cecilia Utari Budihardjo to either the National University of Singapore Library (NUS) or to the Universiti Sains Malaysia Library (USM) in Penang on attachment for the purpose of gaining some experience in accessing online external information services. It would be preferable to send her to Singapore because NUS has had longer experience with online access than USM. The consultant understands that PDIN may have some funds to pay for Mrs. Budihardjo's travel and per diem expenses. But funds will have to be found to pay for the online searches. A sum of US$1,000 would be more than adequate, since the cost of a search seldom exceeds US$40.00.

RECOMMENDATION 11: TECHNICAL CONSULTANTS

IV.32. As stated earlier, PDIN has built up a core of expertise relating to the MINISIS system. It has also been suggested that PDIN should rely as much as possible on its own in-house expertise. Nevertheless, the process of developing the required skills takes time, and at least in the first couple of years, PDIN will still need the help of some technical consultants. It is recommended that the following technical consultants be appointed:

(a) An expert in bibliographic formats (for a period of one week) to help PDIN and the National Library of Indonesia design a national MARC format. In addition, the person concerned should help to revise the PDIN and other database formats that have been defined with a view to bringing them closer to the international standards.

(b) A consultant (appointed for two weeks) to assist PDIN establish the experimental online information retrieval service using the Public Switched Telephone Network. His terms of reference are:

* Assist in establishing the online link using the HP microcomputer or the Apple compatible microcomputer. In this connection, providing advice on the serial communications card that should be purchased (if the Apple compatible is used) as well as the communications software that would be required.
* When the link has been established to provide the necessary training to access external databases effectively.
* Training the staff of PDIN in the techniques of creating user profiles.
* Providing advice on the questionnaire survey to ascertain the usefulness and effectiveness of current awareness or SDI services.

(c) A consultant to help PDIN design the acquisitions system using MINISIS along the lines indicated in this report. This consultancy would last for two weeks.

(d) A consultant may also have to be appointed to assist in designing the serials system if the KARDEX system is found to be unsuitable.

RECOMMENDATION 12: ACQUISITION OF A HIGH LEVEL LANGUAGE COMPILER

IV.33. Some in-house programs will have to be written from time to time to allow a system to interface with the databases created using

MINISIS. A high level language compiler is therefore necessary. PDIN has plans to acquire SPL, a little known programming language developed by HP. Since it is very likely that all the professional computing staff would be more familiar with a general purpose programming language (like COBOL or Pascal), it is suggested that one of these compilers be acquired by PDIN instead. Many authorities tend to favour Pascal over COBOL because the former facilitates structured programming. But it should be remembered that the current Pascal standard only supports sequential files, while COBOL has the capability of handling both sequential and direct (relative and indexed sequential) files. The choice of compiler should be left to the discretion of the PDIN staff, and should be based on their familiarity with a particular programming language.

RECOMMENDATION 13: END USER INVOLVEMENT

IV.34. There is a tendency for the staff who are not part of the computer team to leave matters relating to computerisation entirely in the hands of the staff of the computer section. Moreover, a general reluctance to become more closely involved in the computerisation programme exists. This tendency is unhealthy as well as unwise for various studies have shown that lack of user involvement has been a major cause of failure in many computerisation projects.

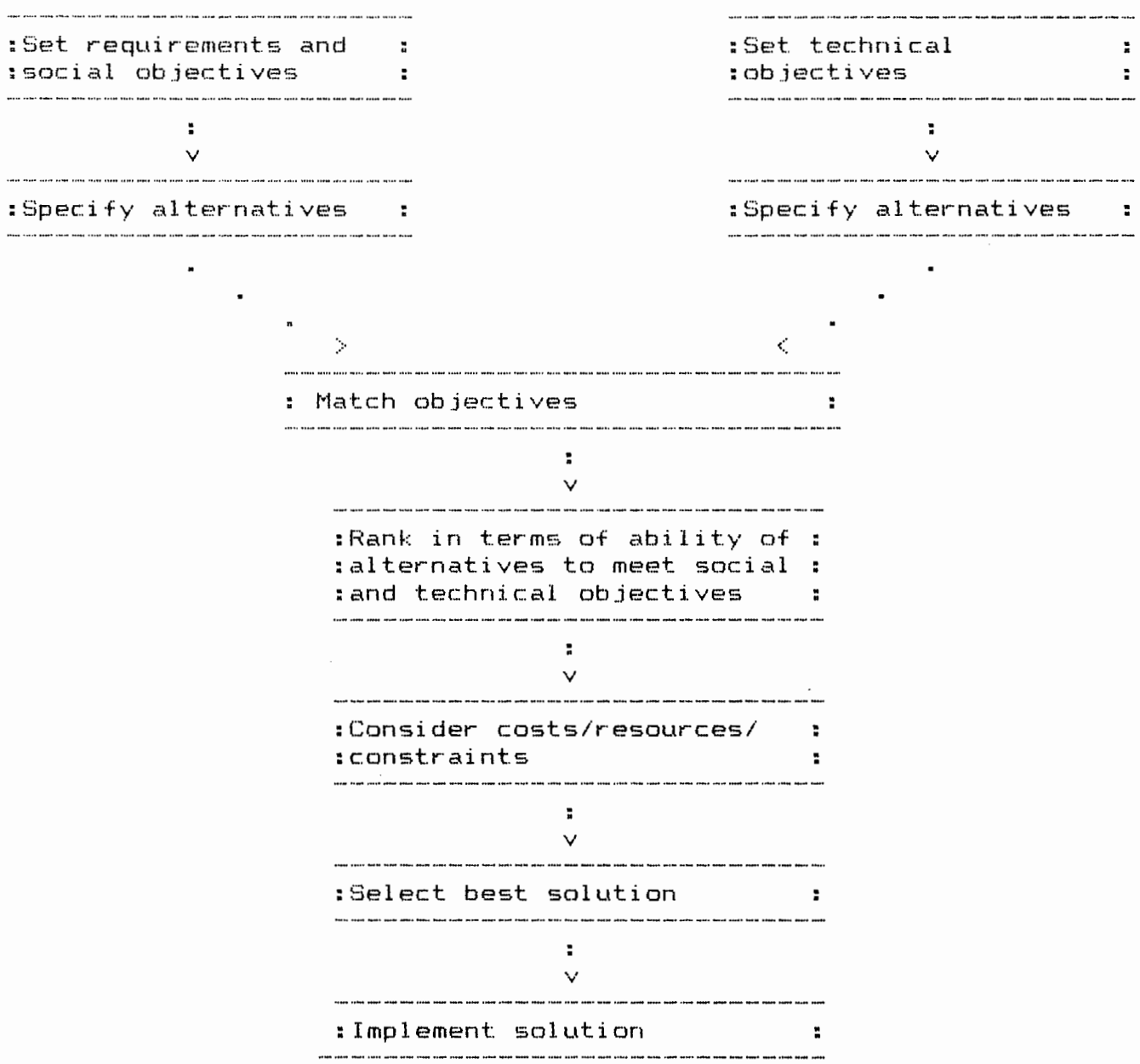
IV.35. One of the big questions relating to user participation is how to encourage such participation. Fig. 14 shows one possible model. In this model, the lack of technical expertise of the user is recognised, and the user participation is confined to defining the requirements and social objectives of the system, while the technical group is responsible for specifying the technical objectives. These

two sets of objectives are then matched, and an ideal solution is found.

IV.36. To encourage a greater degree of user participation, PDIN should establish the mechanisms which would facilitate this. The steps that should be taken include the following:

* Provide opportunities for non computer personnel to attend introductory courses about computers.
* Establish a Steering Committee comprising the heads of the various divisions/sections. The chairperson should be the Director of PDIN. This committee would be responsible for formulating policies, and for solving any problems that may arise in the computerisation programme. It is very necessary that the top management of PDIN be involved in the computerisation effort in order to ensure the success of the computerisation programme. The PDIN management would then be in a position to understand the problems faced by both the computer staff and the end users, and be in a position to quickly determine and provide the necessary resources for the successful completion of a project. Another advantage of having a Steering Committee is that it can ensure that the systems which are developed are compatible with one another; this is very important when the objective is to develop an integrated system, where data are shared.
* Each of the section heads should in turn involve the staff of their sections in planning the requirements. This can be achieved by establishing a sub-committee in each section, comprising both senior and junior officers.

Fig. 14. Model of User Participation,



CONCLUDING REMARKS

IV.37. The development of an integrated computerised system is the ultimate goal of many libraries and information centres. Yet there are surprisingly few institutions which have achieved complete integration. In many cases, automation has been achieved in only specific areas, e.g. circulation control or cataloguing or acquisitions or serials or a combination of these. The reason is that it is only in the last few years that full integrated library packages have been developed commercially, e.g. DOBIS/LIBIS, BASIS, NOTIS, GEAC, URICA, VTLS, etc. But even some of these packages are not complete, as one or more modules may still be under development.

IV.38. PDIN has access to a very powerful relational database management system. The major strengths of MINISIS lie in the powerful processors which allow users to define the databases, input and edit data, manipulate data for retrieval using boolean and logical operators, print reports and undertake simple computation. It is thus possible to develop many automated systems by taking advantage of these processors and also by writing additional programs to manipulate the data in ways not provided by MINISIS.

IV.39. A number of recommendations have been made on the implementation of an integrated system. Because there are many unknown variables, no detailed costings have been provided. With regard to hardware resources such as disk storage and terminals, they appear to be adequate. It is expected that most of the systems will be developed by PDIN using its own internal resources. Only in a few cases will PDIN require the services of technical consultants.

APPENDIX 1

LIST OF PERSONS CONSULTED

PDIN

Luwarsih Pringgoadisurjo, Director.

Blasius Sudarsono, Head, Library Division and computer centre.

Nurasih, computer centre staff.

Lasijan, computer centre staff.

Petra Nusantara, computer centre staff.

Karyeti, Head, Acquisitions Section.

Abdul Rahman Bakri, Head, Serials Section.

Sulistiowati, Head, Technical Services Section.

Zurniaty, Head, Reader Services Section.

Cecilia Utari Budihardjo, Head, Bibliography Division.

Djati Wahjuni, Abstractor, Bibliography Division.

Bambang Supriyo Utomo, Head, Indexing and Abstracting Section.

Elfirza, Literature Search, Bibliography Division.

Bambang Setiarso, Indexer, Bibliography Division.

Maesarah Zulkarjono, Union Catalogue Section.

National Library of Indonesia

Mastini Hardjo Prakoso, Director.

Sutrisno, Head, Collection Development.

S. Nurhadi, Head, Acquisitions.

Sayangbati-Dengah, Head, National Bibliography.

Dady Rachmananta, National Bibliographer.

APPENDIX 2

COMPARISON BETWEEN UNIMARC AND PDIN RD DATABASE FORMAT

UNIMARC	PDIN	NOTES
0--IDENTIFICATION BLOCK		
001 Record Identifier	A120 No. Urut	
010 ISBN	B360 ISBN	
011 ISSN	--	
020 National Bib. No.	--	
021 Legal Deposit No.	--	
022 Govt. Pub. No.	--	
040 CODEN	--	
1--CODED INFORMATION BLOCK		
100 General Processing Data		
101 Language of Work	A170 Kode Bahasa	
102 Country of Pub.	B320 Kode Negara P'bit	
105-123 Various Types of Coded Data Fields	--	
2--DESCRIPTIVE INFORMATION BLOCK		
200 Title and Statement of Responsibility		
$a Title proper	B150 Judul Dokumen	
$c Title proper by another author	--	
$d Parallel title	B370 Judul Parallel	PDIN also includes 2 fields for parallel sub-titles. These can be eliminated as 300 chars. have been allocated for the B370 field.
$e Other title information	B520 Sub Judul1 B540 Sub Judul2	
$f First statement of responsibility	B170 Kepengarangan	
$g Subsequent statement of responsibility	--	
$h No. of a part	--	
$i Name of a part	--	

COMPARISON BETWEEN UNIMARC AND PDIN RD DATABASE FORMAT
(cont'd)

UNIMARC	PDIN	NOTES
$z Language of parallel title	--	
$v Volume designation	--	
204 General Material Designation	--	
205 Edition Statement	B180 Edisi	
206-208 Material Specific Area	--	
210 Publication, Distribution, etc.	B310 Penerbit	
$a Place of pub'n.	B311 Kota Penerbit	
$b Address of pub.	--	
$c Name of pub.	B312 Nama Penerbit	
$d Date of pub'n.	B330 Tahun Terbit	An inconsistency here. Why B330 and not B313? Moreover no. of chars. allocated insufficient.
215 Physical Description	B340 Kolasi	Not subfielded by PDIN.
$a Specific material designation and extent of item		
$b Other physical details		
$d Dimension		
$e Accompany mat'ial		
225 Series		
$a Series title	B460 Judul Seri	
$d Parallel series title	--	
$e Other title information	--	
$f Statement of responsibility	--	
$h Number of a part	B470 Vol/No/Tahun/Hal	Why not treat as subfield of B460?
$i Name of a part		
$v Volume designat'n		
$x ISSN of series	B480 ISSN	Why not treat as subfield of B460?
$z Language of parallel title	--	

COMPARISON BETWEEN UNIMARC AND PDIN RD DATABASE FORMAT
(cont'd)

UNIMARC	PDIN	NOTES
3--NOTES BLOCK		
300 General Note	B350 Catatan	
301-315 Notes Pertaining to Various Aspects of the Physical Make-up of the Item	--	
320 Bibliography Note	--	
321 Availability of and Abstracts Note	--	
324 Facsimile Note	--	
327 Contents Note	--	
328 Dissertation Note	--	
330 Summary or Abstract	C170 Abstrak	
4--LINKING ENTRY BLOCK	--	
5--RELATED TITLE BLOCK	--	
6--SUBJECT ANALYSIS BLOCK		
600 Personal Name Used as Subject	Four fields used for subject, but no documentation to indicate differences:	
601 Corporate Body Name Used as Subject		
602 Family Name Used as Subject	C110 Deskriptor	
	C130 Subyek	Note that C130 and C190 have same name. Why?
605 Title Used as Subject	C160 Deskriptor Sementara	
606 Topical Name Used as Subject	C190 Subyek	
607 Geographical Name Used as Subject		
660 Geographic Area Code	C120 Kode Geografi	PDIN uses too many chars. for this field. 3 would be adequate.
661 Chronological Coverage Code	--	
670 PRECIS	--	
675 UDC	C180 No. Klas UDC	
676 DDC	C140 No. Klas DDC	
677-679 Reserved for Variations of UDC and DDC	--	
680 LC Classification	--	

COMPARISON BETWEEN UNIMARC AND PDIN RD DATABASE FORMAT
(cont'd)

UNIMARC	PDIN	NOTES
681-685 Reserved for Other Major Classification Systems		
7--INTELLECTUAL RESPONSIBILITY BLOCK		
700 Personal Name - Primary Intellectual Responsibility	B110 Pengarang Utama - Dokumen	Not subfield by PDIN
701 Personal Name - Alternative Intellectual Responsibility	---	
702 Personal Name - Secondary Intellectual Responsibility	B120 Pengarang Tambahan - Dokumen	
710 Corporate Body Name- Primary Intellectual Responsibility	B130 Badan Koporasi Utama	In PDIN, this contains a ref. no. and is linked to an authority file. PDIN has also fields for Conference name (B190),Place(B200) Date(B210),Year (B220),Sponsor (B510). It may be desirable to treat a conference as a corporate body.
711 Corporate Body Name- Alternative Intellectual Responsibility	--	
712 Corporate Body Name- Secondary Intellectual Responsibility	--	
720 Family Name - Primary Intellectual Responsibility	---	
721 Family Name - Alternative Intellectual Responsibility	---	
722 Family Name - Secondary Intellectual Responsibility	--	
8--INTERNATIONAL USE BLOCK	---	Since PDIN is the national ISDS centre, it may wish to consider using this block.
801 Originating Source Field		
802 ISDS Centre		
805 Holdings Data Field		

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