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THE LIBRARY



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UNIVERSITY OF LANCASTER LIBRARY RESEARCH UNITSIMULATION KIT NO. 2Introduction

The University of Lancaster Library Research Unit has developed a computerised management game based on a book processing model. It follows the consecutive operations through which a book passes, between the time when a decision is made that it should be included in the library's stock to the time when it is shelved and the catalogue cards are filed in the catalogue. The player has to allocate staff to the processing sections of the library with the aim of finishing the game with the maximum number of books on the shelves and cards in the catalogue, while remaining within the total budget and achieving minimum unit costs: secondary objectives are to achieve a steady state, and to minimise backlogs. The computerised model has been simplified so that it can be played manually, but still retains the principles of the original game.

The Book Processing Game has been designed to provide the student with an overall feel for the interactions which occur within a limited part of the library's operations. The experience gained from actually managing the library under gaming conditions gives the student the opportunity to learn about the decision-making process within the library by the use of simulation, and the opportunity to learn from mistakes made in this situation. In summary, the benefits which can be expected from the use of the gaming method are set out below:

- (i) The student learns by finding out from his own mistakes - mistakes which would jeopardise the performance of the library in the real situation.
- (ii) Simulation-games almost always generate far more interest than conventional lectures or seminars, and the student is better motivated to learn.
- (iii) The student has an opportunity to try out his knowledge of analytical techniques. (Graph plotting, statistics etc.)
- (iv) An overall, integrated picture of the various aspects of policy is presented. It is often impossible to present the true inter-relationships between different policies and measures of performance in any other way.

These are benefits which accrue from the use of any educational simulation game. A short description of the way in which the Book Processing Game developed will show how it fits into this general setting.

In 1970 the University of Lancaster Library Research Unit published a report on a research project which had investigated some aspects of the library's operations by the techniques of Operational Research(1). A model which simulated the work flow and labour allocation in the technical processing sections of the library was developed. It was not used operationally in Lancaster at that time as suitable data was not available.

During 1972 the model was simplified for use as an educational device, designed to teach students of librarianship about the interactions of this aspect of library management.

Real data from the Cambridge Library Management Research Unit, and elsewhere, became available, and was incorporated in the game. A computerised version was first demonstrated in January 1973, and this manual version followed in October.

- (1) Buckland, M.K. & others. Systems Analysis of a University Library; final report on a research project, University of Lancaster Library Occasional Papers No.4. 1970. ISBN 0901699 01 2. (Chapter 4.)

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THE UNIVERSITY OF LANCASTER LIBRARY RESEARCH UNIT

SIMULATION KIT NO.2

BOOK PROCESSING GAME (MANUAL VERSION)

PLAYER'S MANUAL

The player's rôle

The player assumes responsibility for the allocation of labour within and between the processing 'sections' of the library. The flowchart (Fig.1) shows the passage of books from one procedure to the next. Note that the bookseller does not receive a salary from the library; he is merely an intermediate stage between the ordering and accessioning procedures. The game would normally be played for six consecutive months (one complete fiscal period). Each player, or team of players, makes decisions on a month-to-month basis. The main problems are the allocation of resources between staff and book purchase, and the allocation of staff between procedures, so as to speed up the flow of work, while minimising unit costs.

Detailed instructions are given to help players to work through the game and complete the 'performance' tables. By the end of the simulated six-month period you should have completed all the tables. You could spend some time analysing the results of your decisions in terms of backlogs created, cost per book shelved, or any other relevant performance measure. Note that in a 'real life' library situation, a librarian might not wish to shelve a newly processed book until its catalogue cards were filed in the catalogue, and vice-versa, so, in that situation, the number of books actually shelved would be the same as the number of card sets filed in the catalogue.

The following information should be used as a guide to your decision-making:-

a) The Budget

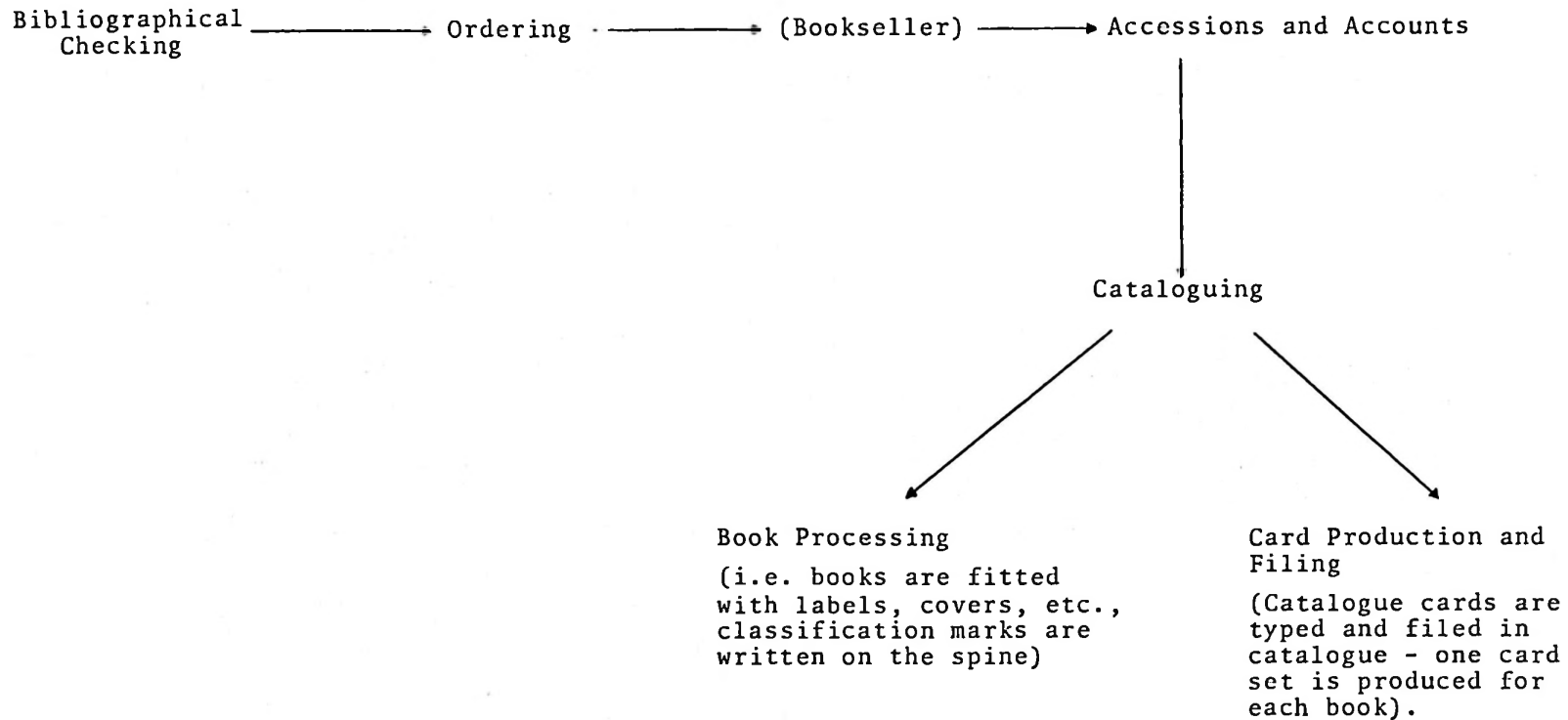
The Game Editor will inform you how much money the Library Committee has allowed the processing sections for expenditure in the six month period. Expenditure in previous periods has averaged £49,000, of which £40,000 was spent on books, the remainder on staff. Initially, staff consists of three seniors and ten junior or clerical staff. Senior staff receive a salary of £1,920 per annum and juniors £1,200 per annum.

All books are supplied by one central bookseller, who offers a good service in that all books are supplied within three months of ordering. Remember that some money has been committed, although not yet spent, when you assume responsibility for the budget.

BOOK PROCESSING GAME (MANUAL VERSION)

Fig. 1

The flow of books through the processing departments of the library



In the first month you will see that 2500 items have been requested for purchase by the library users; you must decide whether or not you can afford to accept all of these requests. The Game Editor will keep account of how many requests, if any, you decide to reject and the total sum will count 'against' you as an (unquantified) 'social cost' to the users of the library. In addition to the requests received in the first month, 3,000 items are already on order, which will arrive (in due course) from the bookseller. Backlogs of work from previous months exist in some sections; these will vary in successive months as material passes through the system.

b) Staff

Assume that all staff are competent to perform tasks in any section to which they may be assigned: there is no penalty for transferring a member of staff from one section to another; however, there is a penalty cost (in addition to their salary) for engaging extra staff; this covers training costs, and amounts to £80 per junior and £100 per senior in the first month in which they are employed. No extra staff may be employed in the first month and staff in post may not be dismissed, although the Game Editor may from time to time inform you that a resignation has occurred. It is important that some senior staff time is allocated to the bibliographical checking and cataloguing processes.

Staff work rates are as follows:-

Section	Items processed per month per person	
	Senior	Junior
Bibliographical checking	950	0
Ordering	1300	1300
Accessioning	1000	1000
Cataloguing	750	550
Card Production & filing (one card set per book)	13700	9200
Book Processing	2000	2000

TABLES I - IV

You are provided with a set of tables headed Table I, II, III, and IV.

Tables I, II and III are supplied in pads of six to each library ready for six successive months' play. Use a new sheet for every months' play.

When completed, Table I will represent the work capacities in each section of the library. The work rates of senior and junior staff have been calculated for you.

Table II is your work record of each section of the library which will show the proportion of work completed in each section. Backlogs are given in month 1 of play, but in future months they depend on your previous decisions.

Table III is your monthly financial record showing staff costs incurred in each section.

Table IV is your final report summarising your performance in each month - funds committed and spent, staff employed, books shelved and cards filed.

The following pages give a set of detailed instructions which you should follow. If you have any difficulty in understanding the instructions or tables, tell the Game Editor and he will advise you.

STAGE	TABLE	COLUMNS	ROWS	ACTION	EXPLANATION
1	-	-	-	Write your library number at top of every work sheet	
2	II	C		Look at backlogs of work	These have been passed on from previous months
3	I	B + E	1-6	Allocate staff to sections	You are not allowed to alter staffing placements in Month 1. In successive months you may find it necessary to employ extra staff: this will give you a cost penalty and raise expenses considerably. Consider how much unused staff time there was in previous months.
4	I	B x C and E x F	1-6	Calculate the work capacity for each section this month. Enter result for senior and junior capacities in Columns D and G	Work capacity = number of staff x work rate.
5	I	D + G	1-6	Calculate sectional work capacity. Enter result in Column H.	Sectional work capacity = senior + junior work capacity in each section.
6	II	B	1-6	Transfer sectional work capacity to Table II.	Take figures from Table I, Column H.
7	II	-	-	Ask Game Editor how many requests for purchase of books have been received from users.	In month 1 this figure is 2500 but it will vary in successive months.
8	II			Consider whether or not you have enough staff to cope with this number of requests. (You cannot engage extra staff in the first month).	Remember existing backlogs and forward planning. i.e. books ordered now will not arrive for a month or two, and in present month you will receive books ordered in previous months. (This will come clear later).

STAGE	TABLE	COLUMNS	ROWS	ACTION.	EXPLANATION
9				<u>Decide</u> how many requests for purchase you can accept	
10				<u>Tell</u> the <u>Game Editor</u> this figure	The Game Editor will keep a record of requests not ordered. This will count against you as a "social cost" (intangible) to the users. YOUR SAVING IS THEIR COST!
11	II	D	1	<u>Write</u> this figure as indicated	This figure is the "input" to the bibliographical checking section in this month
12	II	C + D	1	<u>Calculate</u> the amount of work to be done. Enter sum in Column E, row 1	The sum of the backlog and the input (Col.C + Col.D) is the total work available to be done during the month
13	II	E + B	1	Look at the figures in these locations. You want to know the amount of work actually completed: this is the <u>smaller</u> figure of the two.	Total work available compared to total work capacity gives the amount completed in Section I (i.e. checked forms for correct title and author entries).
14	II	F	1	<u>Write</u> the smaller amount in this location.	The work is now passed to the next section (see flowchart).
15	II	D	2	<u>Write</u> the sum in this location	
16	II	E - F	1	<u>Calculate</u> backlog of work in Section 1.	Backlog = work available - work done (a negative answer is written as 0)
17	II	G	1	<u>Write</u> this amount in this location	
					YOU SHOULD NOW HAVE COMPLETED DETAILS FOR THIS MONTH IN ROW 1 - ALL EXCEPT COSTING FIGURES - THESE WILL BE CALCULATED LATER

STAGE	TABLE	COLUMNS	ROWS	ACTION	EXPLANATION
18	II	C	2		The ordering section now have a backlog of work from previous months plus an input of work passed from Section 1.
19	II	C + D	2	<u>Calculate</u> total work available	Enter in Column E
20	II	F	2	<u>Complete</u> for work done	This is the smaller figure of the work available and the work capacity in this Section (Column B and E)
21	II	G	2	<u>Calculate</u> backlog in this Section	Column E - Column F A negative answer is written as 0
22	II	F	2	Tell the Game Editor the output (i.e. work done) of the ordering section	He will retain this information for use later. Remember that this months orders will not come back from the bookseller for up to 3 months time: the Game Editor has the information for arrivals of books this month.
23				Ask the Game Editor how many books the Accessions Section will receive from the bookseller this month	This becomes the input to the Accessions Section
24	II	D	3	Write the number given by the Game Editor in this location	
25	II	E	3	<u>Calculate</u> total work available	
26	II	F	3	<u>Calculate</u> work done	
27	II	G	3	<u>Calculate</u> backlog	Negative answer written as 0
28	II	F	3	<u>Transfer</u> the amount in this location to column D row 4	The output of the Accessions Section becomes the input to Cataloguing Section (see flowchart)
29	II	E	4	<u>Calculate</u> total work available	
30	II	F	4	<u>Calculate</u> work done	

STAGE	TABLE	COLUMNS	ROWS	ACTION	EXPLANATION
31	II	G	4	<u>Calculate</u> backlog	
32					The output (work done) of the Cataloguing Section is of two types - (a) rough catalogue entries, and (b) book output. (a) is passed to the card processing and filing section, and output (b) is passed to the book processing section.
33	II	D	5&6	Write the amount of output from Cataloguing in these locations	Each book catalogued has to be processed and have its catalogue entry filed. The two figures are identical.
34	II	E	5&6	<u>Calculate</u> total work available	
35	II	F	5&6	<u>Calculate</u> work done	
36	II	G	5&6	<u>Calculate</u> backlogs	Negative answer written as 0
37	III	B, C & D	1-6	<u>Calculate</u> your staff costs from the information in Table I including any penalty cost for employing extra staff this month	Cost = Number of staff x monthly salary. The penalty cost is incurred for one month only to take account of advertising and training costs.
38	III	B, C & D	1-6	<u>Calculate</u> total staff costs in all sections	
39	IV	C	1	<u>Transfer</u> total staff costs this month to final report table	
40	II	F	2	<u>Calculate</u> the total costs committed this month	This is the output from the ordering section (Table II, Column F, row 2) x £4. (We assume that each book costs £4)
41	IV	A	1	Transfer the figure to this location	

STAGE	TABLE	COLUMNS	ROWS	ACTION	EXPLANATION
42	IV	B	1	<u>Calculate</u> total money spent this month.	Table II, Column D, row 3, multiplied by £4
					IF IN DIFFICULTY, SHOUT "HELP" AND GAME EDITOR WILL COME TO YOU.
43	IV	D	1	<u>Enter</u> total expenditure on staff and books.	Table IV, Columns B and C.
44	II	F	6	<u>Transfer</u> this figure to Table IV Column E, Row 1.	This figure is the number of books shelved (i.e. processed) this month
45	I	B & E	7	<u>Transfer</u> total numbers of senior and junior staff to Table IV, Column G, Row 1.	
YOU ARE NOW READY TO GO ON TO THE SECOND MONTH OF PLAY					
46	II	G	1-6	<u>Transfer</u> these figures to month 2 (the second sheet of Table II, Column C.)	The backlogs at the end of one month's play become the backlog at the beginning of the next month.
47	RETURN TO STAGE 2 (ALLOCATE STAFF TO SECTIONS ACCORDING TO BACKLOGS (KNOWN) AND INCOMING ORDERS (UNKNOWN). EMPLOY EXTRA STAFF IF YOU FEEL THIS IS NECESSARY				

End of Month 6, complete table IV. This is your library's 'history'.

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TABLE I WORK CAPACITIES				LIBRARY_____ MONTH_____			
A	B	C	D	E	F	G	H
SECTION	SENIOR STAFF	SENIOR WORK RATE	SENIOR WORK CAPACITY	JUNIOR STAFF	JUNIOR WORK RATE	JUNIOR WORK CAPACITY	SECTIONAL WORK CAPACITY
1 BIB. CHECK		950			0		
2 ORDERING		1300			1300		
3 ACCESSIONS		1000			1000		
4 CATALOGUING		750			550		
5 CARD PRODUCTION & FILING		13700			9200		
6 BOOK PROCESSING		2000			2000		
TOTAL							

TABLE II WORK RECORD						
A	B	C	D	E	F	G
SECTION	SECTIONAL WORK CAPACITY	BACKLOG (UNITS)	INPUT (UNITS)	TOTAL WORK UNITS (C + D)	WORK DONE (SMALLER OF E and B)	REMAINING BACKLOG (E - F)
1 BIB. CHECK		2500				
2 ORDERING		500				
3 ACCESSIONS		0				
4 CATALOGUING		3000				
5 CARD PRODUCTION & FILING		5000				
6 BOOK PROCESSING		1200				
TOTAL						

TABLE III FINANCIAL RECORD - STAFF				
A	B	C	D	E
SECTION	COST OF SENIORS (£160 each)	COST OF JUNIORS (£100 each)	PENALTY COSTS £100 PER EXTRA SENIOR £100 PER EXTRA JUNIOR	TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				63008
TOTAL				

TABLE I. WORK CAPACITIES

					LIBRARY-----		MONTH-----
A	B	C	D	E	F	G	H
SECTION	SENIOR STAFF	SENIOR WORK RATE	SENIOR WORK CAPACITY	JUNIOR STAFF	JUNIOR WORK RATE	JUNIOR WORK CAPACITY	SECTIONAL WORK CAPACITY
1 BIB.CHECK		950			0		
2 ORDERING		1300			1300		
3 ACCESSIONS		1000			1000		
4 CATALOGUING		750			550		
5 CARD PRODUCTION & FILING		13700			9200		
6 BOOK PROCESSING		2000			2000		
TOTAL							

TABLE II WORK RECORD

A	B	C	D	E	F	G
SECTION	SECTIONAL WORK CAPACITY	BACKLOG (UNITS)	INPUT (UNITS)	TOTAL WORK UNITS (C + D)	WORK DONE (SMALLER OF E and B)	REMAINING BACKLOG (E - F)
1 BIB.CHECK						
2 ORDERING						
3 ACCESSIONS						
4 CATALOGUING						
5 CARD PRODUCTION & FILING						
6 BOOK PROCESSING						
TOTAL						

TABLE III FINANCIAL RECORD - STAFF

A	B	C	D	E
SECTION	COST OF SENIORS (£160 each)	COST OF JUNIORS (£100 each)	PENALTY COSTS £100 PER EXTRA SENIOR £100 PER EXTRA JUNIOR	TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				
TOTAL				

TABLE I. WORK CAPACITIES

A SECTION	B SENIOR STAFF	C SENIOR WORK RATE	D SENIOR WORK CAPACITY	E JUNIOR STAFF	LIBRARY		MONTH	
					F JUNIOR WORK RATE	G JUNIOR WORK CAPACITY	H SECTIONAL WORK CAPACITY	
1 BIB. CHECK		950			0			
2 ORDERING		1300			1300			
3 ACCESSIONS		1000			1000			
4 CATALOGUING		750			550			
5 CARD PRODUCTION & FILING		13700			9200			
6 BOOK PROCESSING		2000			2000			
TOTAL								

TABLE II WORK RECORD

A SECTION	B SECTIONAL WORK CAPACITY	C BACKLOG (UNITS)	D INPUT (UNITS)	E TOTAL WORK UNITS (C + D)	F WORK DONE (SMALLER OF E and B)	G REMAINING BACKLOG (E - F)
1 BIB. CHECK						
2 ORDERING						
3 ACCESSIONS						
4 CATALOGUING						
5 CARD PRODUCTION & FILING						
6 BOOK PROCESSING						
TOTAL						

TABLE III FINANCIAL RECORD - STAFF

A SECTION	B COST OF SENIORS (\$160 each)	C COST OF JUNIORS (\$100 each)	D PENALTY COSTS \$100 PER EXTRA SENIOR \$100 PER EXTRA JUNIOR	E TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				
TOTAL				

TABLE I. WORK CAPACITIES

A SECTION	B SENIOR STAFF	C SENIOR WORK RATE	D SENIOR WORK CAPACITY	E JUNIOR STAFF	LIBRARY		MONTH	
					F JUNIOR WORK RATE	G JUNIOR WORK CAPACITY	H SECTIONAL WORK CAPACITY	
1 BIB.CHECK		950			0			
2 ORDERING		1300			1300			
3 ACCESSIONS		1000			1000			
4 CATALOGUING		750			550			
5 CARD PRODUCTION & FILING		13700			9200			
6 BOOK PROCESSING		2000			2000			
TOTAL								

TABLE II WORK RECORD

A	B	C	D	E	F	G
SECTION	SECTIONAL WORK CAPACITY	BACKLOG (UNITS)	INPUT (UNITS)	TOTAL WORK UNITS (C + D)	WORK DONE (SMALLER OF E and B)	REMAINING BACKLOG (E - F)
1 BIB.CHECK						
2 ORDERING						
3 ACCESSIONS						
4 CATALOGUING						
5 CARD PRODUCTION & FILING						
6 BOOK PROCESSING						
TOTAL						

TABLE III FINANCIAL RECORD - STAFF

A	B	C	D	E
SECTION	COST OF SENIORS (\$160 each)	COST OF JUNIORS (\$100 each)	PENALTY COSTS \$100 PER EXTRA SENIOR \$100 PER EXTRA JUNIOR	TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				
TOTAL				

TABLE I. WORK CAPACITIES

SECTION	B	C	D	E	LIBRARY		MONTH
					F	G	
	SENIOR STAFF	SENIOR WORK RATE	SENIOR WORK CAPACITY	JUNIOR STAFF	JUNIOR WORK RATE	JUNIOR WORK CAPACITY	SECTIONAL WORK CAPACITY
1 BIB. CHECK		950			0		
2 ORDERING		1300			1300		
3 ACCESSIONS		1000			1000		
4 CATALOGUING		750			550		
5 CARD PRODUCTION & FILING		13700			9200		
6 BOOK PROCESSING		2000			2000		
TOTAL							

TABLE II WORK RECORD

A	B	C	D	E	F	G
SECTION	SECTIONAL WORK CAPACITY	BACKLOG (UNITS)	INPUT (UNITS)	TOTAL WORK UNITS (C + D)	WORK DONE (SMALLER OF E and F)	REMAINING BACKLOG (E - F)
1 BIB. CHECK						
2 ORDERING						
3 ACCESSIONS						
4 CATALOGUING						
5 CARD PRODUCTION & FILING						
6 BOOK PROCESSING						
TOTAL						

TABLE III FINANCIAL RECORD - STAFF

A	B	C	D	E
SECTION	COST OF SENIORS (£160 each)	COST OF JUNIORS (£100 each)	PENALTY COSTS £100 PER EXTRA SENIOR £100 PER EXTRA JUNIOR	TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				
TOTAL				

TABLE I. WORK CAPACITIES

A SECTION	B SENIOR STAFF	C SENIOR WORK RATE	D SENIOR WORK CAPACITY	E JUNIOR STAFF	LIBRARY_____MONTH_____		H SECTIONAL WORK CAPACITY
					F JUNIOR WORK RATE	G JUNIOR WORK CAPACITY	
1 BIB.CHECK		950			0		
2 ORDERING		1300			1300		
3 ACCESSIONS		1000			1000		
4 CATALOGUING		750			550		
5 CARD PRODUCTION & FILING		13700			9200		
6 BOOK PROCESSING		2000			2000		
TOTAL							

TABLE II WORK RECORD

A	B	C	D	E	F	G
SECTION	SECTIONAL WORK CAPACITY	BACKLOG (UNITS)	INPUT (UNITS)	TOTAL WORK UNITS (C + D)	WORK DONE (SMALLER OF E and B)	REMAINING BACKLOG (E - F)
1 BIB.CHECK						
2 ORDERING						
3 ACCESSIONS						
4 CATALOGUING						
5 CARD PRODUCTION & FILING						
6 BOOK PROCESSING						
TOTAL						

TABLE III FINANCIAL RECORD - STAFF

A	B	C	D	E
SECTION	COST OF SENIORS (\$160 each)	COST OF JUNIORS (\$100 each)	PENALTY COSTS \$100 PER EXTRA SENIOR \$100 PER EXTRA JUNIOR	TOTAL STAFF COSTS
1				
2				
3				
4				
5				
6				
TOTAL				

TABLE IV

FINAL REPORT

LIBRARY_____

	A	B	C	D	E	F	G
MONTH	FUNDS COMMITTED (£4 PER BOOK)	FUNDS SPENT (£4 PER BOOK)	STAFF COSTS £	TOTAL SPENT (B + C) £	BOOKS SHELVED	CARDS FILED	STAFF EMPLOYED SENIOR JUNIOR
1			1480				
2							
3							
4							
5							
6							
TOTAL							

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THE UNIVERSITY OF LANCASTER LIBRARY RESEARCH UNIT

SIMULATION KIT NO.2

BOOK PROCESSING GAME
(MANUAL VERSION)

GAME EDITOR'S MANUAL

Game Editor

The Game Editor's function is to act as a free-lance library statistics officer, by maintaining records of work received and completed in two 'sections'. He may also have to give advice to players in difficulties. The players' instructions are set out in such a way that the game editor will be periodically called upon to release information.

Although the game would normally be played for six consecutive months, there is no reason why this could not be extended to twelve or more months by a simple adjustment of the data and work-sheets. (Note, however, that a six-month run will occupy anything from two to four hours on the first attempt). Each player (or team of players - three is probably the best number) makes decisions on ordering and staffing on a month-to-month basis.

One copy of Table A should be used to record information for each 'library' over a six-month period. The first column of Table A lists pre-set numbers indicating the quantity of requests received from library users for the purchase of items for library stock. The first task is to inform the players how many requests for purchase were received in Month 1 (see Stage 7 in the instructions). The player must then decide how many requests can be accepted for bibliographical checking; record this figure in Column 2, and work out the number of requests not accepted; enter this figure in Column 3.

At Stage 22, the player will state the output of the ordering section which will be passed on to the bookseller; enter this figure in Column 4. The player will then ask how many items for accessioning will be received from the bookseller in a particular month of play. At the beginning of play 3000 items are already on order, of which 2000 can be expected in the first month, therefore input to accessions is 2,000. In subsequent months however, the procedure is slightly different. Using Table B, and if necessary the formulae given, work out arrivals (A_m) in successive months resulting from a number (N_m) ordered in month (m). E.g. supposing 800 orders were sent to the bookseller in month 1; locate 800 in the first column of Table B and look across the Table to see how many of those 800 will arrive in months 2, 3 and 4. 480 will arrive in month 2, 240 in month 3, and 80 in month 4. (This game assumes that all orders will be fulfilled within three months of ordering). These three figures should then be entered diagonally in Columns 6-8, the first number in Column 6, the second in Column 7, and the third in Column 8. The row total of Columns 6, 7 and 8, entered in Column 9, will be the input of items from the bookseller to the accessions department in a given month.

An example of part of a completed Table is given for illustration.

4	5	6	7	8	9
No. of orders processed and passed to bookseller	Month	ARRIVAL OF BOOKS FROM BOOKSELLER			Total input to accessions (paid for)
1400	m	2000	-	-	2000
900	m + 1	840	800	-	1640
	m + 2	540	420	200	1160
	m + 3		270	140	
				90	

TABLE B - Game Editor

Showing arrivals (A_m) in successive months resulting from a number (N_m) ordered in month m .

ORDERS N_m	ARRIVALS		
	$A_m + 1$	$A_m + 2$	$A_m + 3$
10	6	3	1
20	12	6	2
30	18	9	3
50	30	15	5
75	45	22	8
100	60	30	10
200	120	60	20
300	180	90	30
400	240	120	40
500	300	150	50
600	360	180	60
700	420	210	70
800	480	240	80
900	540	270	90
1000	600	300	100
1100	660	330	110
1200	720	360	120
1400	840	420	140
1800	1080	540	180
2000	1200	600	200
2500	1500	750	250
3000	1800	900	300
3500	2100	1050	350
4000	2400	1200	400
5000	3000	1500	500

Formulae to be used for number of orders not shown in table:-

N_m = Orders in month m

$A_m + 1 = \frac{3}{5} N_m$

$A_m + 2 = \frac{3}{10} N_m$

$A_m + 3 = \frac{1}{10} N_m$

TABLE A - Game Editor

Library_____

1	2	3	4	5	6	7	8	9
Number of requests received from users	Number of requests accepted by bib-check section	1 - 2 (social cost of not ordering	Number of orders processed & passed to bookseller	Month	Arrival of books from Bookseller			Total input to accessions (paid for)
<u>2500</u>				m + 1	2000	-	-	2000
<u>3000</u>				m + 2		800	-	
<u>100</u>				m + 3			200	
<u>2000</u>				m + 4				
<u>1000</u>				m + 5				
<u>1500</u>				m + 6				
				m + 7				
				m + 8				

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[illegible]

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AUTHOR

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Simulation kit no. 2 : a
library management game...

DATE DUE

BORROWER'S NAME

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