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# MANAGEMENT DESIGN PROCUREMENT COLLECTION LIBRARY IN INDONESIA

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**Abstract**

The library collection development process involves several important tasks, including identification, selection, acquisition, processing, and distribution of collections to the public. This study seeks to develop a library collection procurement application that focuses on two main functions: selection and procurement. This management accommodates stakeholders, including publishers, librarian profiles, master management, and other users, while adhering to specific user and management requirements. The design methodology used in this study utilizes the Unified Modeling Language (UML). The development process follows the waterfall method, including stages such as needs analysis, design, implementation, verification, and maintenance. The resulting application has an intuitive interface for collection procurement, incorporating essential components such as a login mechanism, a comprehensive book collection database, catalog data management, procurement selection tools, recommendation algorithms, catalog selection options, and access to selected catalog data. Using the CodeIgniter (CI) framework, this management facilitates the process of filtering and selecting data based on publication year, price, and language criteria. Rigorous management testing, conducted through black box testing methods, confirmed the functionality and reliability of the application. This study contributes to meeting the needs of libraries that lack robust collection procurement management, offering a sophisticated solution to streamline and automate traditional manual processes.

**Keywords:** Library collection procurement management, development collection library, base data collection library

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## INTRODUCTION

Library academic is part integral from process learning in in institution academic, Which functioning as management Supporter Which vital. Library responsibleanswer

For provide various collection For fulfil need student And lecturer in various field knowledge, so that support condition various department university. Collection This usually consists of from various type document, like book, picture, inscription, archives, And material other Which important For study And learning academic ( August, 2019 ).Collection This can covers source Power print And digital Which managed in a way expert. Development collection covers determination policy For election, identification need users, election document, distribution source Power, And budgeting ( Mr. Suryadi, 2022 ). Need users, policy development collection, election, procurement, evaluation, weeding, And preservation is all field development collection ( Agbanu et al., 2019 ). Processdevelopment collection can give satisfaction And satisfaction for user library.

Procurement Library collection is a series policy development collection And on Finally leading on procurement material library ( Murnahayati, 2018 ). This is the process of acquiring collections ( Atef, 2020 ). Procurement of materials library done For match collection library And make sure of it in accordance with need users. Activity Matching This need election Which careful For ensure that Items Which chosen fulfil need users. More Far, use tool selection Which appropriate very help librarian in find collection Which in accordance with need users. Toolselection Which most general used in library covering catalog publisher print, list book, reviewbook in magazine And letter news, base data CD-ROM, address on line, display book, And suggestion user through management library ( Ashilungu) And Onyancha, 2024 ). Room scope And relevance Diversity material library present challenge for manager library For choose Items Which in accordance And fulfil need users. Matter This need approach Which careful And management to election collection. Election manual often time produce results Which not enough accurate. As a result, library need develop management development collection integrated Which Work The same with management other libraries to optimize the implementation of library automation. Library automation involves the use of automated and semi-automated data processing machines to perform activities. library traditional like acquisition, cataloging, And circulation ( Tripathy, 2023 ). Management computer change activity library traditional become automation computer (Yanni, 2016). Transformation This is part from library electronic or digital. According to manifesto IFLA, library digital is collection digital online Which made or collected And managed in accordance with principles development collection Which accepted in a way international, can accessed in a way coherent And sustainable, with service Supporter Whichallow user For access And utilise source its power ( Anna, year 2018 ).

Library must to design And build management procurement. Management This is application special Which designed For manage activity procurement collection, including management information And base data procurement collection. Management This must in harmony with framework management library, Which covering planning, organizing, implementation, And monitoring ( Ultimately, 2018 ). Information flow in a management And used For reach objective. Information is component important Which interact with element other in a management.

Management consists of from parts Which interact in room And time, exchange material, energy, or information in a way measurable ( Sillitto et al., 2017 ). Definition the emphasize that a management consists of from a number of element or component Which each other relate. By Because That, "information" often accompany term "management", Which refer to on a bunch element Which each other related Which Work The same For reach a objective. Ridwan (2021) define management as elements Which each other relate Which aiming For reach a objective, whereas information is data Which experience process processing so that more beneficial for the recipient. Data This must relevant, appropriate time, efficient, And accurate ( Filiery And McLeay, 2014 Terms “management information" Which general used referring to on interaction between person, process algorithmic, data, And technology ( Sudarmaji) & Pranoto, 2020 ). By Because That, management information (SI) is a bunch component Which each other relate Which designed For gather, manipulate, keep, And to spread information, provide mechanism bait Indonesia For reach objective ( Ghomari, 2022 Components the is source Power Which need fulfilled. Components the covering technology (device hard, device soft, And data), network communication, man, And process ( Bourgeoisie et al., 2019 ) , Pham et al., (2021) stated that information management has six component main: device hard, device soft, network communication, data, person, And process. Allcomponent play role important in build management information.

Term "design And development" known wide in management application For to design And make program application. Design And development involving translation results analysis to in package device soft And Then make or increase management in accordance with That ( Gunawan et al., 2021 ). Product from study This is A management application Which provide feature selection collection And procurement in a way automatic.

Study Which wide has done on design And development management information library. This including design And development management information library And archive ( Saputro et al., 2022 ), design and development of web-based library management with QR codes (Hermanto, 2020), design And development management information library use Java ( Wijaya, 2019 ), and online library applications ( Syukron, 2016 ). None of the previous studies offer management feature development collection. By Because That, study This stand out Because focusin a way special on design And development management development collection library. Novelty study This located on its features, Which in a way special customized For procurement collection library.

Study This aiming For develop management application procurement collection library Which can utilized by library in Indonesia Which Still depend on activity manual And Not yet own management procurement special. Implementation management the very important For optimize processing And service library, Which on Finally will speed up digitalization library in Indonesia.

## RESEARCH METHODS

The methodology used to obtain data in this study includes interviews with library staff regarding library collection procurement procedures in Indonesia. Interview sources include procurement librarians from college libraries, regional libraries, school libraries, public libraries, and special libraries. Furthermore, discussions were held with the directors or leaders of each library. In addition, data collection includes compiling a list of books scheduled to be acquired by the library.

This study adopts the Software Development Life Cycle (SDLC) which consists of several important stages in the design and development of management. SDLC is a structured framework that involves sequential processes in management development. The Waterfall method, one of the commonly used SDLC models, is also utilized in the development of information management or software in this study (Wahid, 2020 ), including the stages of requirements, design, implementation, verification, and maintenance. SDLC is a framework for planning, analyzing, designing, developing, testing, and implementing software (Hossain, 2023). All of these phases are directed at one theme, namely quality assurance, in this case, providing software quality to users (Lemke, 2018). The quality of management or software is also influenced by other factors that are categorized into seven dimensions: management quality, service/support or vendor quality, management use, perceived usability, user characteristics, organizational structure, and management style (Kalankesh et al., 2020).

The management design adopted in this study uses the Unified Modeling Language (UML), a standard language widely used in industrial settings to describe requirements, perform analysis, design, and illustrate architecture in an object-oriented programming paradigm. The UML used includes various diagrams, including use case diagrams, entity relationship diagrams, class diagrams, and flowcharts. Use case diagrams serve as visual representations that introduce management, where actors such as operators and users are involved with management. Meanwhile, flowcharts explain management operations sequentially, which include tasks such as book data management, book data input by users, and recommendation processes.

This study uses an Entity-Relationship Diagram (ERD) that describes the database structure that contains relationships between objects or data in the database in the form of entities, attributes, and entity relationships. Library material procurement recommendation management is modeled with a class diagram built based on a use case diagram. The design of the class diagram is used to form a data storage structure that will be used by management. Data Flow Diagram (DFD) is a graphical representation of management. In this study, DFD consists of criteria management, data cataloging, book selection, and making library material recommendations. Management testing in this study uses the Black Box Testing method, which is a logic-based method to determine whether the input matches the desired output according to user needs. Black Box Testing ensures that each process functions as expected based on the desired needs (Wijaya & Astuti, 2021). .

## RESULT AND DISCUSSION

### Results

The implementation of this database schema refers to the ERD (Entity Relationship Diagram) design, as seen in Figure 1.

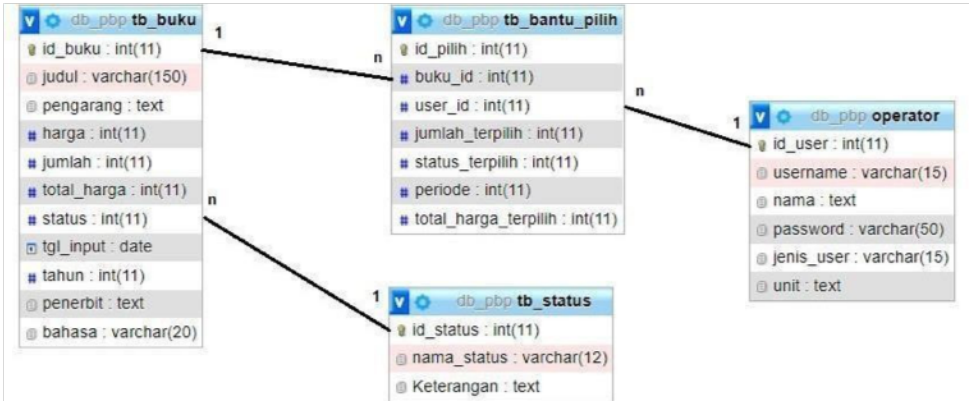



Figure 1. Database schema.

From the database schema, tables for Operator, Book, Helper Select, and Status are created. The library procurement management interface in this study looks like the one in Figure 2.

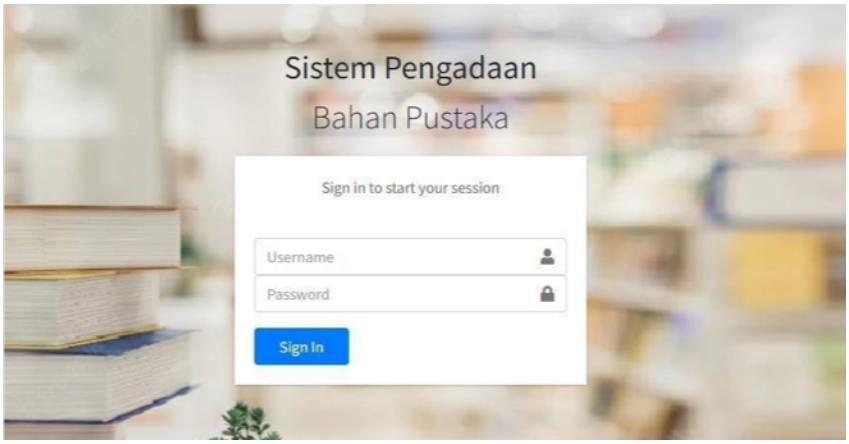



Figure 2. Management Login Interface

The figure illustrates the login interface of web-based library material procurement management. Login is the initial display of management that appears when management is first opened via a web browser. Users are required to enter a username and password to access management. If the username and password are incorrect, management will display an error message.

The book collection database menu shows the library collection, seen in Figure 3.

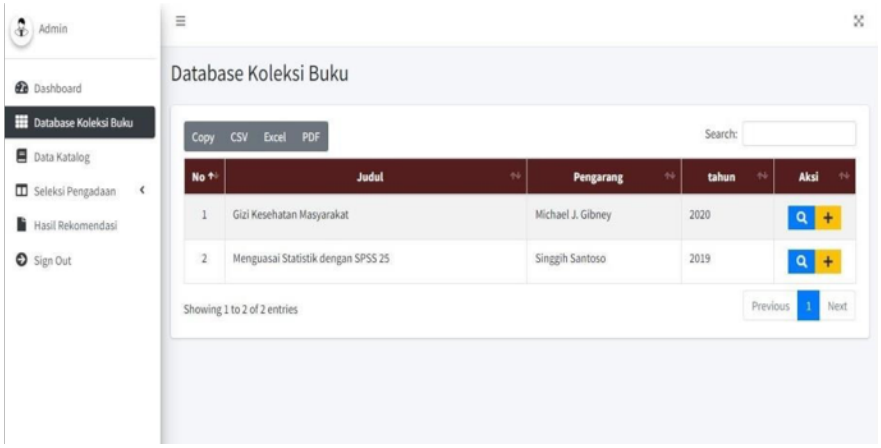



Figure 3. Book Database View

The menu provided functions to check whether the collection selected by the user is already available in the database. On this page, the operator will see the books that are already in the library. The operator can edit and delete books from the book collection database list. This menu needs to be provided because the selection of collections is also done through duplicates. The catalog data interface is a menu that contains bibliographic data from a list of books such as title, author, city of publication, year of publication, and price. This catalog data is used by the user to select the books to be acquired. The list of books comes from several publishers and will be sorted according to the user's needs. The catalog data interface looks like the one shown in Figure 4.

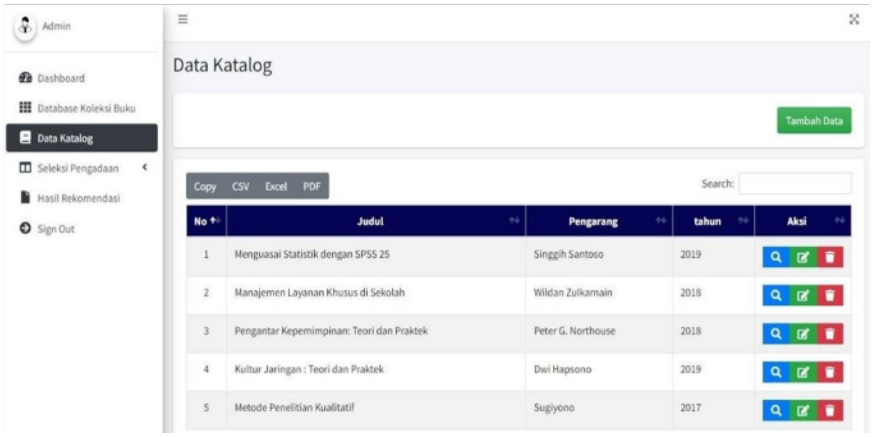



Figure 4. Catalog data interface (Source: author documentation)

Figure 4 above illustrates the Book Catalog Data interface in web-based library material procurement management. On this page, operators will see the books that will be distributed to users as considerations for acquiring library materials. Operators can edit and delete books from the book catalog data list.

The procurement selection interface is a menu used by the admin to select books selected by the user. This menu is very important considering that in developing library collections, there are two activities that need to be carried out by the library: selection and procurement. Selection activities are carried out by librarians and users, while procurement activities are carried out by the procurement team appointed by the head of the institution. The procurement selection interface looks like Figure 5 below.

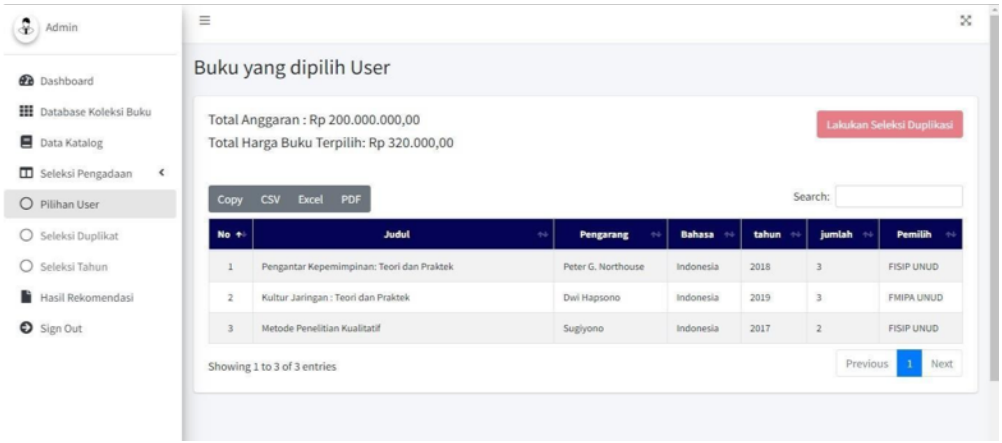



Figure 5. Procurement selection interface (Source: author documentation)

The image above illustrates the selection process interface. The selection starts by sorting duplicate data. Next, the total price of the book will be calculated to determine whether it exceeds budget. If the total price exceeds the budget, it will move to the next selection, which is the year selection. The selection process will be completed when the budget and the total price of the book are the same.

The last menu available in the management interface is the recommendation results menu. This menu contains a list of books that have been selected by users and operators. This menu also shows the maximum budget allocation for book procurement, as seen in Figure 6 below.

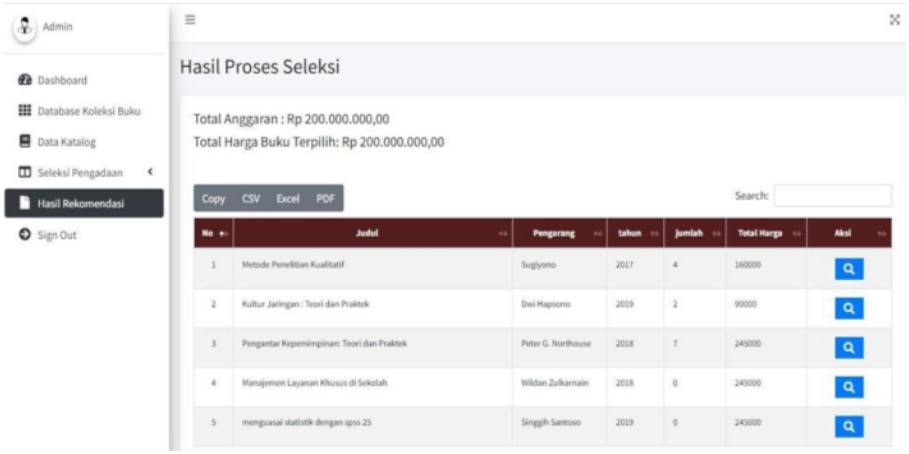



Figure 6. Interface recommendation results (Source: author documentation)

The image above shows an interface that displays the results of the book selection process selected by the user in web-based library material procurement management. On this page, the operator will see the books that have been selected. At this stage, the management flow has been completed, and the library operator can follow the recommendation results.

The management implementation uses the CodeIgniter (CI) framework, which has an MVC (Model View Controller) architecture. The MVC model helps organize programming according to its tasks and facilitates management learning. The first implementation involves the process of data elimination and selection based on year, price, and language considerations. After the elimination process, the recommendation process is carried out, as shown in Table 1 below.

| Lines | Code fragment |
|---|---|
| | public function process_check_duplicates ( ){ |
| | $cek= $this->M_buku->proses_cek_duplicate ( ) ); foreach ($cek->result() as $row){ |
| | $this->db-> where( 'book_id', $row->book_id); |
| | $this->db->delete('tb_bantu_pilih'); |
| | $this->M_buku->process_delete_duplicates ( ) ; |
| | $this->M_buku->process_update_status ( ) ; |
| | public function recommendation_results( ){ |
| | $curr=$this->M_books->select_data_curr()-> row( ); |
| | $data['budget ']= $this->rupiah($curr->budget); |
| | $cek= $this->M_buku->all_total_prices_selected ( ) ); |
| | $total=0; |
| | foreach ($check-> result( ) as $price){ |
| | $total+=$price->total_selected_price; |
| | $curr=$this->M_books->select_data_curr()-> row( ); |
| | $data['budget ']= $this->rupiah($curr->budget); |
| | $data['total_selected ']= $this->rupiah($total); |
| | $data['book ']= $this->M_book->recommendation_results(); |
| | $this->load->view('v_hasil_rekomendasi ',$ data); |
| | } |

above shows that management testing using Black Box Testing shows that all user needs (Users and Operators) are met. This shows that the library material procurement management that is designed and developed can operate according to management planning.

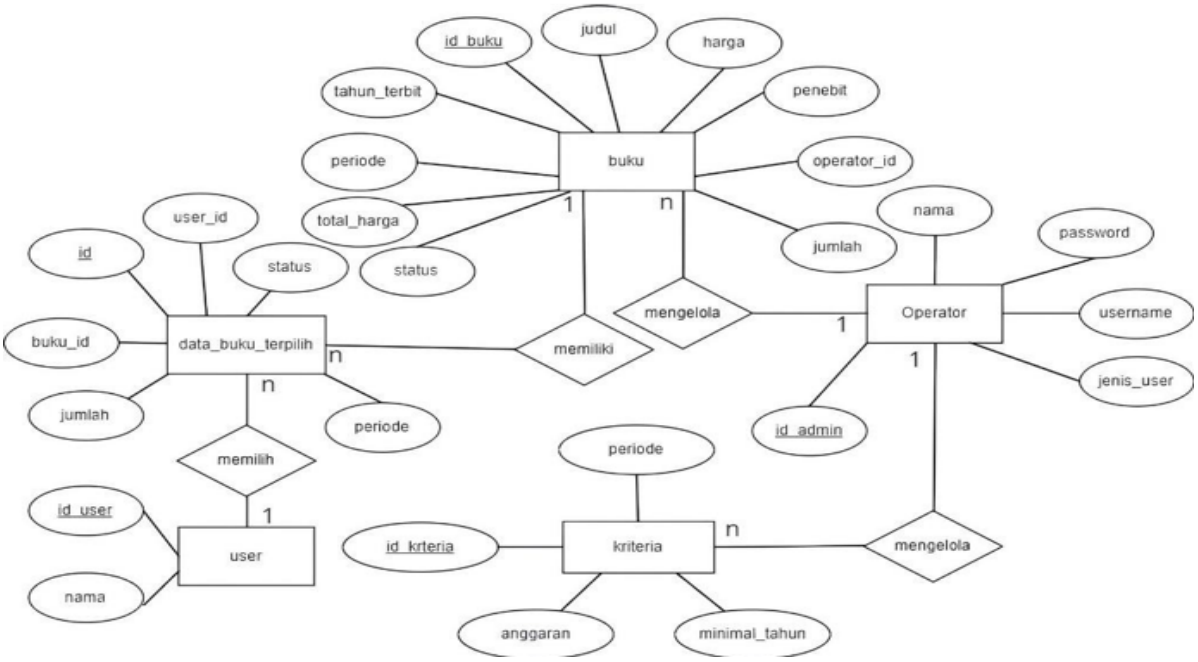
**Discussion**

Library Collection Development Management (LCD) in this study can connect users with library materials because this management provides pre-selected and pre-determined results. This management can match needs with documents appropriately. Therefore, Library Collection Development Management can function as a means of interaction between people and technology to achieve goals. This management can help librarians in bridging the gap between users and libraries and can serve their clients using cutting-edge technology. The interaction process brings people together with the information provided by management.

The Library Collection Development Management Design has been successful, because its design is in line with the waterfall method and the Unified Modeling Language (UML) model. The features available in this management meet the needs of the library, considering that this management uses the Software Development Life Cycle (SDLC), a software

development method associated with a structured framework that contains a sequential process in which information management is developed.

Implementation of Library Collection Development Management consists of database and interface implementation. Database schema implementation refers to Entity Relationship Diagram (ERD) design. ERD design looks like Figure 7 below.




Entity relationship diagram for library materials procurement management

From the designed ERD, there are 4 entities involved, including books, criteria, operators, users, and selected_book_data. The relationships that occur between the above entities are as follows:

1. A 1:N relationship between an operator entity and a book entity, where 1 operator can manage many books.
2. 1:N relationship between book entity and selected_book_data entity, where 1 book can have many selected_book_data.
3. 1:N relationship between user entity and selected_book_data entity, where 1 user can have many selected_book_data.
4. relationship between an operator entity and a criteria entity, where 1 operator can create many criteria.

The implementation of the interface is done to ensure that the software management and its results meet the needs of both users and the management itself. The interface provided in this Library Collection Procurement Management consists of a Login form, Book Collection Database, Book Catalog Display, Procurement Selection, Recommendation Results, User Catalog, and Procurement Results.

Overall, the management interface works well, where all interfaces can be utilized effectively by management users, including users, operators, and administrators. Users who log in as administrators are given access rights to all menus available in management. The menus provided for administrators include dashboards, book collection databases, catalog data, procurement selection, and recommendation results. Meanwhile, the menus provided

for users include book selection, selected books, and procurement results. With their respective access rights, management users are expected to use management according to their roles, ensuring data security in management.

The Book Collection Database Menu in this study is used by administrators or operators to view collections owned by the library. Operators can edit and delete books registered in the book collection database. This menu is needed considering that collection selection is also done through duplication. The results of the Library Collection Development Management design have been tested using black box testing, which tests management functionality. The test results show that the management functionality has run well. This shows that management functions, such as data structures, interfaces, and other functions, are correct.

## CONCLUSION

The design of library collection development management in this study has been operating optimally according to its plan. This management has been tested with library users in Bali, who found that this management can be used in their respective libraries. Until now, there is no information management specifically designed for collection procurement that has been implemented in libraries in Bali. However, this management has not provided a central catalog (shared catalog) that offers a list of selected books for all types of libraries. Instead, this management only provides a catalog menu for each library, which means that the types of books needed in regional or public libraries may not be available in university libraries. Therefore, this management is suitable for use in every type of library. Library Collection Development Management can be further developed by adding several features that can be used to provide benefits to various library users, overcoming the limitations of current management in the future. .

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