

Web-Based Asset Management Information Systems in Higher Education

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ABSTRACT

This study aims to determine the Asset Management Information System in Higher Education. The research method used in this study is the SLR (Systematic Literature Review) method. In this study, SLR (Systematic Literature Review) is used to identify, review, evaluate, and interpret previous studies on the Google scholar database with a period of the last 10 years, namely 2013-2023. The results showed that universities do not yet have an internal information system to control their assets. The absence of an asset management information system will have difficulty in tracing asset data. Solutions to overcome existing problems require a web-based asset management information system that can carry out asset management to be more efficient and organized, and make it easier to collect the number of assets, data about assets based on their condition, grouping assets by type, and make it easier to search asset data.

Keywords:

Asset Management, Asset, Assessment, Asset Management Information System

INTRODUCTION

Higher education plays a vital role in fostering knowledge, research, and community advancement. In today's rapidly evolving technological landscape, effective management of resources within universities has become increasingly critical. These resources encompass not only physical infrastructure but also digital assets, human capital, and various elements that facilitate the educational and research processes.

Assets, whether tangible or intangible, hold economic or exchange value for corporate entities, institutions, or individuals (Lembaga Administrasi Negara, 2007). Improved management practices are essential to oversee these assets, necessitating adequate administrative tools for their maintenance and control. Asset management faces numerous challenges due to the dynamic nature of asset records, affected by procurement, write-offs, and potential losses. Any changes to these assets require corresponding modifications in the recording process, from initial planning to eventual removal.

In the realm of higher education, assets are integral, yet the sheer volume and growth potential often lead to errors in planning, procurement, and data inventory. Effective asset recording is crucial for informed decisions regarding new acquisitions, especially in determining the most suitable assets to procure.

The management of university assets currently lacks efficiency and productivity, primarily relying on tools like MS Excel for processing and managing asset data. This dependence results in prolonged data searches, particularly during accreditation or Higher Education requests, leading to increased time consumption. Additionally, the use of such tools introduces the risk of typographical errors and inadvertent data loss.

The adoption of an Asset Management Information System presents a viable solution for handling the complexity of university assets. SIMA offers a comprehensive framework for asset management, covering planning, acquisition, maintenance,

valuation, and write-offs. However, the effective implementation of SIMA aligned with university needs remains a considerable challenge.

This article endeavors to encapsulate the essence of Asset Management Information Systems, drawing insights from pertinent studies to assess different approaches' strengths and weaknesses. Furthermore, it seeks to provide recommendations for designing and executing adaptive and efficient SIMA solutions within higher education.

Through amalgamating and synthesizing information from diverse credible sources, this article aspires to offer valuable insights for practitioners, researchers, and decision-makers. Its objective is to enhance operational efficiency, mitigate risks, and maximize the utilization of assets within the higher education landscape.

METHOD

Sugiyono (2016: 2)(Sugiyono, 2018) defines research techniques as systematic and scientific approaches used to collect data for specific aims and applications. The utilized methodology in this study is The SLR technique refers to the Systematic Literature Review process. Systematic literature review memenuhi tujuan penelitian tertentu dengan transparan dan berusaha mencakup semua bukti yang telah dipublikasikan mengenai topik tertentu dan menilai kualitas bukti tersebut (Lame, 2019).

Sources that become references are research articles accessed through Google Scholar. On the Google Scholar site, the author enters keywords related to the topic, namely web-based Asset Management Information Systems with a research span for the last 10 years. That is the year 2013-2023. Search results found 24,300 articles After that we selected articles that met the criteria by doing *skimming* or speed reading techniques. The criteria used its relevant and up to date. After conducting analysis through *skimming techniques* , the results were obtained in the form of 17 research articles that were suitable to be used as research sample. The following is a mapping of article searches that have been sorted by researchers :

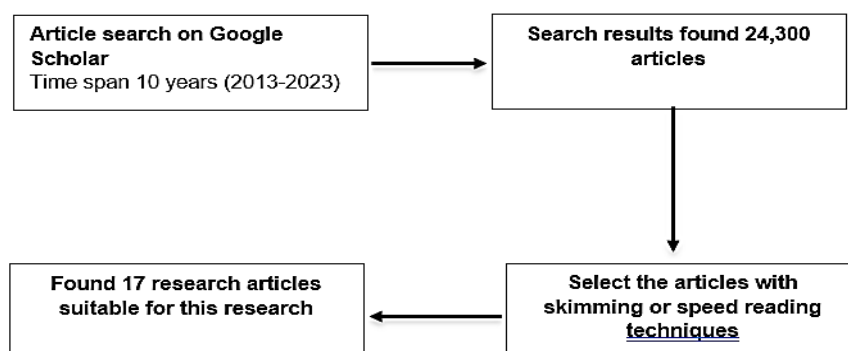


Figure 1. Article Search Process Mapping

After collecting 17 research articles that have met the criteria of this article, there are important points from the results of research on 17 articles regarding the asset management information systems in higher education as for the composition of the article obtained by the author are as follows :

Table 1. Article Composition Table

Article Title	Total
Asset Management Information System Design at University	11
Asset Management Information System at the Faculty of Engineering	2
Asset Management Information System at UPT facilities and infrastructure	1
Asset Management Information System in libraries	2
Asset Management Information System in Computer Laboratory	1
Total	17

RESULTS AND DISCUSSION

Table 2. Article Research

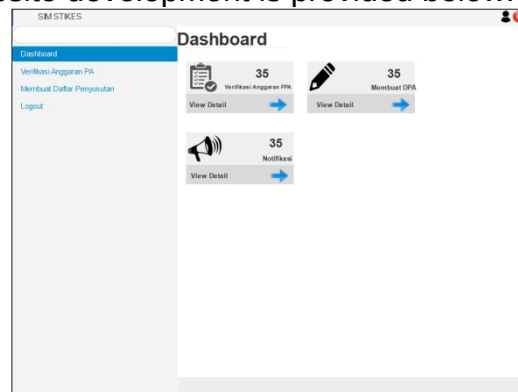
Research Title	Author	Research Results
Development Asset Management Information System For Schools Health At Tasikmalaya	Ankky Suchiadilla , Faiza Renaldi & Irma Santikarama (2018)	The resulting information system can provide data on assets, asset tracking, asset management, asset maintenance, asset depreciation, and the management of asset mutations and write-offs at the Health Sciences College (STIKes) in Tasikmalaya.
Digitization Of Information Systems Asset Management At Akrb	Ridho Surya Kusuma , Lukman Reza & Alamsurya Kubara Endriharto (2023)	The outcome of this research is a tool lending website that will facilitate the tasks of maintenance staff in the management, maintenance, documentation, and availability of equipment at the Academy of Communication Radya Binatama (AKRB) Yogyakarta.
Application Asset Management With Mappyourtag	Khanna Tiara S.Kom, Hendra Kusumah, S.Kom, & Dian Mustika Putri (2017)	The outcome of this research is a management asset application system that scans the barcodes created for each asset
Design Of Asset Management Information System At Flores College Foundation (Yapertif)	Rainarius Gale Goa , Ferdinandus Lidang Witi & Melky Radja (2022)	The developed asset management information system is expected to enhance the efficiency and structure of asset management. Additionally, it aims to facilitate the recording of the quantity of assets, categorizing assets based on their conditions, and grouping assets according to their types.
Design of Asset Management Information System at Pamulang University	Fajar Desta Putra , Joko Riyanto, & Ahmad Fikri Zulfikar (2020)	This asset management information system can provide convenience in recording the number of assets, recording asset conditions, and grouping assets based on their type and making it easier to search for data.

Research Title	Author	Research Results
Asset Management Information On Web-Based Mikroskil	Hardy, William, Andri, Sherson Watson (2016)	The repair flow of an asset becomes more organized. Transactions in the asset management information system include request, repair, maintenance, adjustment, destruction, procurement and receipt.
Web-Based Asset Management Information System at Perbanas Institute	Welda Mudiari & Ujang Hidayat (2019)	The Asset Management Information System is expected that all asset data is well recorded, the data management process is fast and centralized, data management is more effective and efficient and the system is more efficient. Reporting can be done at any time depending on the need.
Bangka Belitung State Manufacturing Polytechnic Asset Management Information System	Riki Afriansyah (2022)	The Bangka Belitung State Polman asset management information system makes it easier for admins and staff to manage asset data and present information faster because it uses a QR Code to view detailed information related to the asset.
Design Of College Asset Management Information System With Simple Additive Weighting (Saw) Method	Fajar Nugraha (2013)	Information systems with the Simple Additive Weighting (SAW) method in college asset management can be used to provide information to relevant parties regarding assets owned and their conditions.
Web-Based Asset Management Information System at Pagaram College of Technology	Yogi Isro' Mukti, M.Kom. 2018	It can be concluded that, for administration and equipment purposes, the system facilitates the supervision and reporting process of asset data
Asset Management System for Asset Tracking Optimization Using the Analytical Hierarchy Process	Akrim Teguh Suseno , Abdul Razak Naufal & Devi Astri Nawangnugraeni (2021)	This information system is employed to support decision-making in prioritizing asset tracking and procurement. It ensures that asset tracking and procurement are conducted precisely and efficiently.
Development of Information System for Information Technology Asset Management (Case Study: STIKI Malang)	Francino Gigih Adi Saputro (2017)	An information processing system has been devised to facilitate the PUSKOM staff in managing the information technology assets of STIKI Malang and addressing the recording of transactions related to the management of information technology assets. This includes transactions such as additions, mutations, repairs, and disposal of information technology assets.

The discussion on the design of Asset Management Information Systems (AMIS) at universities involves several key considerations to ensure efficiency, accuracy, and adaptability to the unique needs of higher education institutions.

Research carried out by Suchiadilla et al., (2018) at Tasikmalaya College of Health Sciences has resulted in the creation of an information system that offers features such as asset tracking, management, maintenance, depreciation, mutation, and recovery at STIKes in Tasikmalaya. This system not only facilitates the recording of asset data but also enables tracking, management, maintenance, and depreciation, ensuring that the reported asset information aligns with the anticipated data and

information standards for STIKes in Tasikmalaya. An illustrative instance of an asset information system website development is provided below:



Gambar 5. Desain interface awal bagian keuangan

Figure 2. asset information system website

The initial interface design of this finance section is to see what can be done in the system to be built

Research conducted by Surya Kusuma et al., (2023) at AKRB Yogyakarta has led to the development of a tool aimed at enhancing the efficiency of maintenance personnel tasks. This instrument is designed to streamline administration, maintenance processes, data collection, and tool availability at the Radya Binatama Communication Academy (AKRB) in Yogyakarta. The motivation for this research stems from the observation that the current asset management system at AKRB Yogyakarta is conventional and lacks integration. From the recording of tools to reporting, the entire process is still reliant on paper. An illustrative example of a website form created through this research is as follows:

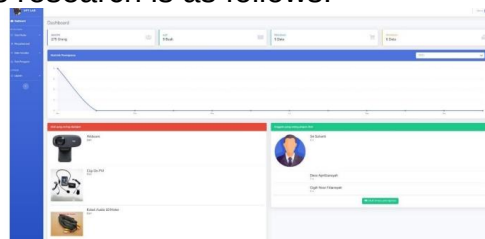


Figure 3. asset information system website

The website dashboard serves as the initial page accessible to officers upon logging into the system using their unique credentials. Within the dashboard, officers can view various information, such as member data, tools, procurement details, and lending statistics specific to AKRB Yogyakarta. The dashboard also highlights lending trends, showcasing frequently borrowed tools and members who regularly engage in tool borrowing activities.

In a study conducted by Tiara et al., (2017), at STMIK Raharja Tangerang, titled 'Application of Asset Management with Mapyourtag in University,' the research explored the implementation of an asset management system using a scanning mechanism. This system involved the utilization of Barcodes generated for individual assets. Each barcode, representing a unique asset, provides information such as the asset's operational commencement date, type, and location. The asset management application was developed using the Map Your Tag application. The following outlines the design of the application.



Figure 4. asset information system website

A recent study conducted by Rainarius Gale Goa et al., (2022) at Flores University (YAPERTIF) resulted in the development of an Asset Management Information System using the waterfall methodology and comprehensive testing, including blackbox testing. The primary goal of implementing this system is to enhance efficiency and organization in asset management, enabling the collection of data regarding the number and condition of assets, grouping assets by type, and facilitating the retrieval of asset information within Yapertif. Another related study was carried out by Putra et al., (2020), focusing on designing an Asset Management Information System at Pamulang University. In contrast to the former study, this research incorporated both the waterfall method and blackbox testing, along with the addition of whitebox testing. The subsequent section outlines the system design developed in this study:

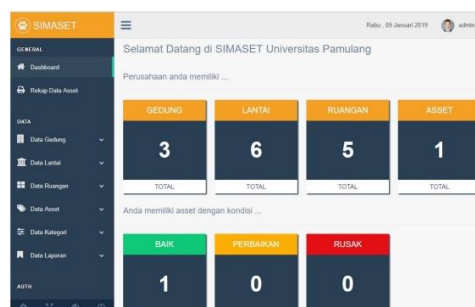


Figure 5. asset information system website

In a study conducted by Hardy et al., (2016) on the development of the Asset Management Information System at STMIK Mikroskil, it was found that the system was created using the waterfall method, encompassing stages such as data collection, identification, requirements analysis, model design, implementation, and testing. The web-based asset management transactions included demand, repair, maintenance, destruction, adjustment, receipt, borrowing, and return of assets. Another study by Mudiar et al., (2019) at Perbanas Institute also adopted the Waterfall model, initiating with software needs analysis and providing functionalities for asset registration, maintenance, movement, deletion, and reporting.

Similarly, Afriansyah, (2022) explored asset management information systems at the Bangka Belitung State Manufacturing Polytechnic, utilizing the prototype method. This approach involved active participation of asset management personnel throughout the development stages, ensuring alignment with the preferences and requirements of system users. The asset management information system at Polman Negeri Babel incorporated QR Codes to facilitate quicker access to detailed

information about assets, streamlining data management for administrators and staff. The system enabled easy data filtering based on reporting needs, such as filtering damaged assets. The filter feature proved beneficial for leaders in making decisions regarding damaged or replacement-worthy assets. Additionally, the system offered export features in pdf and excel formats, simplifying the reporting process to central agencies for BMN Polman Negeri Babel's asset data. The description below provides an illustration of the developed asset management information system:

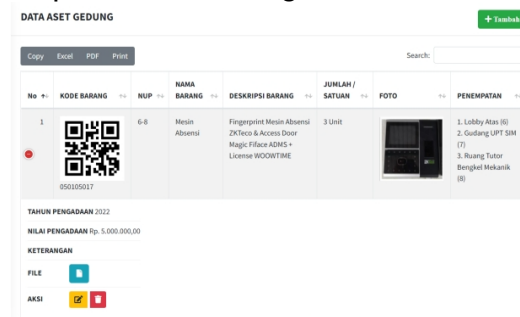


Figure 6. asset information system website

The generation of building asset data summaries allows for conversion into various formats such as Excel and PDF, and the ability to print summaries. The system also automatically generates QR codes. Within the building asset data menu, users can make additions, modifications, and deletions to the asset data for the building.

Nugraha, (2013) conducted research utilizing the Simple Additive Weighting (SAW) method. This methodology incorporates profit and cost criteria, with the profit criterion emphasizing maximum profit, and the cost criterion focused on minimizing costs. The implementation of the SAW method in university asset management information systems serves to accurately and comprehensively inform relevant parties about owned assets, their conditions, and the evolution of these conditions. The SAW method further aids in supporting the asset management process, particularly in evaluating alternative asset procurement winners based on predetermined criteria.

Pagaralam College of Technology developed a Management Information System through research by Isro'Mukti, (2018), employing web engineering system development methods. The system, designed using Unified Modeling Language (UML) and utilizing MySQL for databases, PHP programming language, and the Bootstrap framework for layouts, is a web-based asset management information system.

Additionally, Suseno et al., (2021) researched the development of asset management information systems at ITS NU Pekalongan using the Analysis Hierarchy Process (AHP) method. The objective of this information system is to facilitate decision-making processes related to asset tracing and acquisition, ensuring that these processes are carried out effectively.

Gigih Adi Saputro, (2017) conducted research on Information Technology asset management at the Indonesian College of Informatics & Computer (STIKI) Malang. To address the numerous challenges in managing information technology assets, a website-based information system was implemented. Transactions related to information technology asset management at STIKI Malang include additions, mutations, repairs, and destruction of information technology assets.

Asset Management Information System at the Faculty of Engineering

Table 3. Research Article

Research Title	Author	Research Results
Web-Based Asset Management Information System For Optimization of Asset Tracing In Undip Industrial Engineering	(Galih Setyo Pambudi, Sriyanto , Ary Arvianto)	The results of this research are information systems that can run the asset management business process to be neat and structured so that department asset managers can easily manage and trace assets.
Application Design Of Atk / Bhp Asset Management Information System At The Faculty of Engineering, Pattimura University	Ryfalidy Yainahu , Arthur Y. Leiwakabessy , Jonny Latuny (2022)	This research produces a management information system design that helps process Office Stationery asset management data in the Consumables category at the Faculty of Engineering, Pattimura University which can provide information on the entry and exit of asset data and the location of the asset placement room.

The integration of technology in educational institutions has become imperative for efficient management and utilization of resources. In this context, the implementation of an Asset Management Information System (AMIS) at the Faculty of Engineering plays a crucial role in enhancing the overall effectiveness of asset management processes.

Research carried out by Yainahu et al., (2022) at the Faculty of Engineering, Pattimura University focused on developing an Office Stationery asset management information system application within the Consumables category. The study identified shortcomings in the existing system, particularly in providing detailed information about the entry and exit of goods and the location of asset placement rooms. The outcome of this research was the creation of a comprehensive management information system for tracking the inflow and outflow of ATK/BHP assets in each lecturer room, laboratory, workshop, and student staff area within the Faculty of Engineering. The data storage database utilized for asset information was MySQL. To illustrate, an exemplar of the design of the management information system is presented below:

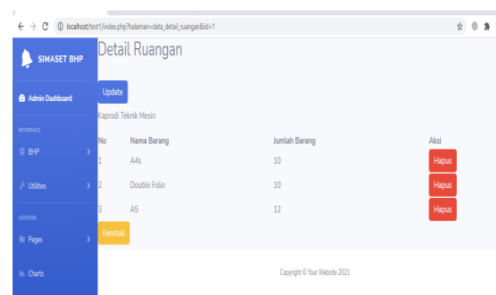


Figure 7. asset information system website

This page displays BHP (Barang Habis Pakai) asset information, the number of rooms, the number of asset types, and the number of assets used as a whole but not in detail. Because details can be immediately seen and changed on the appearance on the side-bar of the dashboard. Further Research conducted by Pambudi et al., (2017) in Industrial Engineering Undip with the aim of optimizing asset search. This research is motivated because asset management has so far only recorded the availability of assets through Excel data collection, which has not been updated for a long time. Many assets do not have inventory numbers provided by the Procurement

Service Unit (ULP) of the Faculty of Engineering. The database used in building this asset management application system is MySQL. The following is the design of the asset management information system developed:



Figure 8. asset information system website

Using the development of asset management information systems have several advantages, namely:

- The new system uses the website as a means of asset management so that the database will be stored online and realtime.
- Detailed data collection of inventory items and consumables can facilitate asset tracing.
- The process of reporting asset data can be done easily according to the required category.
- Supervision from the head of the department can be done directly through the new system.

Asset Management Information System at UPT facilities and infrastructure

Table 4. Research Article

Research Title	Author	Research Results
Web-Based Asset Management Information System Web At Sumbawa Technology University	M. Zayyan Musoffa , Eri Sasmita Susanto & Yudi Mulyanto (2022)	The conclusion of this research is to produce a Web-based Asset Management Information System at Sumbawa Technology University which is able to facilitate the management of Sumbawa Technology University assets to be more effective and efficient.

The effective management of facilities and infrastructure within UPTs is essential for ensuring optimal functionality and resource utilization. This article delves into the implementation and benefits of an Asset Management Information System (AMIS) specifically tailored for UPT facilities and infrastructure. The AMIS streamlines the tracking and maintenance of various assets within UPTs. From buildings and equipment to utility systems, the system facilitates a centralized approach to managing assets, enhancing efficiency in tracking, maintenance, and overall resource utilization.

Research conducted by Musoffa et al., (2022) at Sumbawa University of Technology produces an asset Management Information System for UPT. Facilities and Infrastructure. UPT. Facilities and Infrastructure still carry out asset data collection, asset growth, asset write-off, and asset transactions, through Google Form and Microsoft Excel, UPT. Facilities and Infrastructure often experience difficulties in the process of finding data, calculating asset growth is not uncommon even document loss, data errors, data loss and takes a long time if it has not been computerized compared to using information systems. The software development approaches employed include the System Development Life Cycle (SDLC) spiral model and the

black-box trial method. The system built is a system used to facilitate UPT asset management. Facilities and Infrastructure under DPPF (Directorate of Procurement and Maintenance of Facilities) Sumbawa University of Technology. Such as managing asset data, asset procurement, asset procurement decisions, seeing asset growth, seeing asset depreciation, asset write-off, asset monitoring and maintenance, and generating output in the form of asset annual reports automatically and can create and print asset QR Codes.

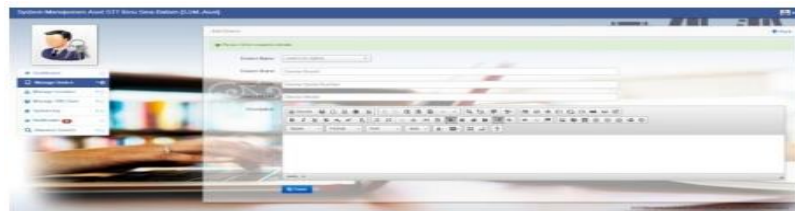
Asset Management Information System in libraries

Table 5. Research Article

Research Title	Author	Research Results
Design of a Digital Scientific Asset Management System In Higher Education Libraries	Aries Setiawan, Juli ratnawati, Adi Prihandono, Budi Widjajanto & Ida Farida (2023)	With the existence of a digital scientific information system, it is able to save space for asset placement, because everything is accommodated in a softfile that can be enjoyed by readers at any time.
Aset Management Information System With Sdlc Method (Software Development Life Cycle) (Case Study of Stt Ibnu Sina Batam)	Ririt Dwiputri Permatasari (2017)	Asset processing at STT Ibnu Sina Batam is managed using Microsoft Excel and not all are programmed in the asset management system. Therefore, it needs an asset management information system. In designing the asset information system, the SDLC (Software Development Life cycle) method is used. The designed asset information system can provide real time and accurate information so as to help asset management officers in providing the report.

The library is a university unit that deals with the treasury of scientific assets. Scientific assets include textbooks, reading books, student final projects, journals, CDs containing writing and video files. Every period is always budgeted for the procurement of books, every period after the implementation of the final project or thesis exam, then the hardcopy of the final project that will be used as literature also increases. Therefore, it is necessary to create a Digital Asset Management System. Research conducted by Setiawan et al., (2023) regarding Digital Scientific Asset Management System for Libraries in University using the Waterfall method. The Waterfall model is defined as a model that contains a sequential approach to the software lifeline, with stages ranging from analysis, design, implementation, testing and evaluation. The advantage of this information system is that it collects all book data and other literature in the Library in the form of digital files, visitors will easily get literature by simply searching the asset system.

Further research conducted by Permatasari, (2017) at STT Ibnu Sina Batam who designed an asset management information system. Asset Management Information System based on Web Mobile and MYSQL Database. In Asset Management Information Systems only discuss asset procurement, inventory, placement, status changes, and reports. The following is the design of the System for managing assets and information developed:



Gambar 27. Tampilan Halaman Add Device

STT IBNU SINA BATAM					
SYSTEM MANAGEMEN ASET STT IBNU SINA BATAM (SINA-ASET)					
SINA-ASET 48 Stock					
DATE: Tuesday, August 17th, 2017					
INVENTORY CODE	TYPE	MODEL	BRAND	DESCRIPTION	STATUS
AC001	Asus CompuCase (ACU)	15.6	15.6	15.6	Repairing
AC002	Asus CompuCase (ACU)	15.6	15.6	15.6	Used
AC003	Powercase	Powercase	Powercase	Powercase	Repairing
AC004	Powercase	Powercase	Powercase	Powercase	Used
NOTHING FOUND					
RECAPITULATION					
TYPE	TOTAL			STATUS	TOTAL
Repairing	0			Used	1
Used	0			Repairing	0
Supervisor	0			Used	2
Power Supply	0			Repairing	0
Power Case	0			Used	1
Power Card	0				
ACU	0				
Prepared by:			Received by:		
Hari Kurniawan			Rizki Dwiastuti P. ST. M. SI		
Technology Facilitator			Bid. Administrasi dan Keuangan		
			Check by:		
			Il. Lariyung, MT		
			Ketua STT Ibnu Sina Batam		

Figure 9. asset information system website

Asset Management Information System in Computer Laboratory

Table 6. Research Article

Research Title	Author	Research Results
Implementation of the Laravel Framework on the Computer Laboratory Asset Management Information System	Muhammad Iqbal Awaluddin, Rita Wahyuni Arifin, & Didik Setiyadi (2020)	The result of the research is an information system for management in assets that can provide information between the number of items in the laboratory with stored records that will be more accurate, the recording process will be neat and reduce the occurrence of data loss because the data is stored in the form of files, searching for data will be much more effective and efficient, the use of the Laravel framework can make it easier for admins to manage applications easily.

Research conducted by Awaluddin et al., (2020) at Bina Insani University with the title Implementation of the Laravel Framework in Computer Laboratory Asset Management Information Systems. The research produced a web-based laboratory houses an asset management system capable of overseeing and controlling various resources device data collection and lending of network practicum equipment at Bina Insani University. The application was developed using the Rapid Application Development (RAD) methodology. With the existence of an information system for management in assets, this system facilitates the retrieval of accurate information regarding the quantity of items in the laboratory, minimizing data loss by storing information in file format. Additionally, it enhances the efficiency and effectiveness of data search. The utilization of the Laravel framework simplifies application management for administrators.. Here is an example of a website page that has been developed.

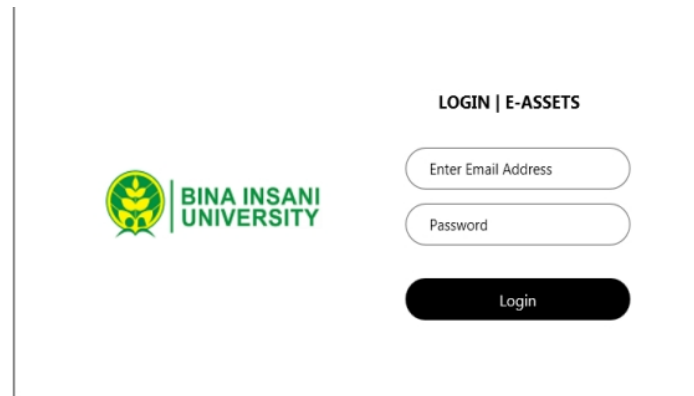


Figure 10. asset information system website

CONCLUSION

The conclusion of this study is a Web-Based Asset Management Information System can facilitate asset management to be more effective and efficient. The Asset Management Information System aims to provide comprehensive and accurate recording of all asset data, streamline the data management process by centralizing it, enhance the effectiveness and efficiency of data management, and enable flexible reporting based on specific demands.

Recommendations

Processing of asset data by the responsible admin must be carried out carefully, especially throughout the course of inputting inbound and exiting goods, therefore as to produce accurate information data. The system can still be developed with the addition of the Data Verification feature directly from the Faculty admin to the Rectorate. Applications can be developed to the management of fixed assets, temporary assets, to capital assets according to the needs of the Faculty.

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