Information management design for higher education

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Abstract

Background of the study: The existence of information management unit is important for the continuity of information life cycle. However, in reality, not all institutions have this unit. This research was conducted to provide an overview of information management at universities that do not yet have a special information management unit.

Purpose: This research aims to provide a design information management that can be applied, especially at the UIN Malang or other public universities; especially those that have similar conditions with this university.

Method: This study utilized a qualitative method and a case study approach. Through in-depth interviews with parties who understand the flow of the university's work. In addition, observations were conducted at other institutions with comparable structures to develop a workable information management design for this institution.

Findings: An information management design at Universitas Islam Negeri Malang can be implemented with policies and division of work in certain units owned by this university.

Conclusion: A workflow, especially for information management, must be implemented with commitment from all units involved, so that the absence of a related unit does not become a barrier to information management.

Keywords: information management; university information management, higher education

Introduction

Information plays an invisible but critical function in every institution and must be managed effectively. Small or large organizations have great relevance to information management, to communicate in any language or form here the need for information is the main element (Radovic-markovic & Vucekovic, 2015) The existence of regulations regarding Freedom of Information (FOI) or some countries call it the Right to know is one of the trigger for the preparation of information management frameworks, especially for public. Freedom of information itself was recognized historically by the United Nations in 1946, and was established by 190 world leaders as a Sustainable Development Goal in 2015 (Halligan & Cronin, 2020). Most countries that have passed and implemented freedom of information regulations also have information management frameworks for their public institutions. Canada, the United Kingdom, Australia and several other countries have information management frameworks in their respective government systems. For example, Australia's information management framework has even been implemented up to the local government level and made Australia Connected Government country in the early 2000s. Meanwhile in Indonesia, a similar regulation on freedom of information only emerged in 2008 through Law No.14 on Public Information Disclosure and was implemented 2 (two) years after its endorsement in 2010. The Law on Public Information Disclosure explains that every public body is obliged to provide and serve information needs in fast, timely, low-cost, and simple manner.

The concept of information management is often translated as managing information technology, especially in network or application design, as in a study related to organizational aspects and collaboration with information management at the Thai Provincial University Libraries, which resulted in a local network design between libraries (Nonthacumjane et al., 2022). A similar point of view is also found in research on analyzing information management strategies in higher education in China, which refers to the means. The results of this research state that information management for higher education requires information technology devices, networks, and the information management platform itself (Wang, 2024). The information management referred to in this paper is the management of information itself, which involves many potential resources in an organization or institution.

A research review of the information management literature proves that it is specific because it combines skills and resources in various fields (Opoku, 2015). Therefore, an organization with many resources must design various ways and strategies for implementing information management. Several studies have proven the importance of information management for organizations. One of them is research on the importance of information management for education, where information management is one of the components for achieving the goals and work efficiency of the world of education, starting from professional staff to schools and other educational institutions. This research also concludes that online services and information exchange forums support information management activities (Khamzah et al., 2017).

Furthermore, information management in an organization can be studied based on an evaluation of its implementation. The information management process implemented based on a strategic plan will significantly impact its effectiveness and alignment with the organization's goals (Azhar Mohamad et al., 2022). In line with this research, another study on evaluating information management processes was conducted at Nigerian Universities. A good information management process impacts the effectiveness of an organization's decision-making, especially in research studies at universities (Stephen, 2015). Apart from evaluations, implementation studies of information management efforts have also been carried out, not at higher education institutions but at library institutions. The results of this research show that

collaborative and sustainable implementation of library programs can be one of the strategic efforts in implementing information management in libraries (Banerjee & Maity, 2023).

In Indonesia, public boards are institutions that carry out their main functions and duties related to the administration of the State, some or all of which are funded by the State Budget (Peraturan Komisi Informasi Republik Indonesia Nomor 1 Tahun 2021 Tentang Standar Layanan Informasi Publik, 2021). Many public institutions have prioritized information management since 2008, when the law on public information disclosure was first drafted. This requirement necessitated the hiring of documentation and information manager in all public institutions. While this should be standard practice for all public boards, there are still many public boards that only have an Information Documentation and Management Officer (PPID) and do not actually manage their information or documents. Monitoring data from the Central Information Commission (KIP) in 2022, shows that only 24.63% of all public boards are informative (Communication and Information Technology, 2022).

Higher education as a public institution also has an obligation to provide information needs for the public. Information management is carried out to process information and distribute it efficiently, so that the value of the information can be received appropriately according to its use (Opoku, 2015). This need for relevant and timely information can only be obtained if the organization or institution carries out a good information management process. In the case of universities, several universities in Indonesia that have been awarded the title of Informative Public Agency by the Central Information Commission of the Republic of Indonesia, such as Brawijaya University and Gadjah Mada University, are universities that have organizational structures that have information management institutions ranging from Information Management and Documentation Officers (PPID), Information Systems and Information Technology Centers, Archive Centers, to well-managed libraries. Just as information management involves many resources, research related to information management will often be implemented with information technology as a means and other related units. Research on records and information management was conducted with research results on the need for a policy to guide and control the course of records and information management in Nigerian Public Universities (Muhammad, 2021).

Universitas Islam Negeri Malang is one of the top 3 state Islamic universities in Indonesia which is also a public board. Universitas Islam Negeri Malang itself in terms of organizational structure actually has several supporting institutions related to information management that have been well managed. Some of them are university libraries that have received A accreditation and have information technology management units and databases in charge of managing information systems and technology infrastructure. Unfortunately, the college does not yet have an archive centre, even though the potential for generating information in the form of important documents and sheets of paper is very large every year so that the record centre is important to be part of information management. In practice, all work units at the Universitas Islam Negeri Malang carry out their own information management, separately and do not yet have a mutually agreed upon work guideline. The work units in question are not only work units related to information management, but all existing work units ranging from units that take care of finance, student affairs, public relations, even to the smallest work units, namely faculties and study programmers.

There is currently no devoted department for handling information and documentation at Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang. However, its professional activities include a great deal of data and information. Existing work units require and generate data that serves as information for other units, creating a recursive loop of information sharing. Therefore, a university must have effective information management in place. The development and management of information in education area is also important as a basis for

understanding the importance of information management at the time they are working in areas that are more challenging (Khamzah et al., 2017; Zulkipli et al., 2021). Managing information entails the processes of perceiving, collecting, organizing, processing, and maintaining information (Altındağ & Öngel, 2021). Based on the importance of information management in public institutions including universities, this research question is as follows what is the current condition of Universitas Islam Negeri Malang as a public board in managing information, and what is the right information management design for universities, especially those that do not have a specialized information management unit like UIN Malang.

The study of information management as an information management process is interesting, especially in the information era, which makes information a main commodity in all business processes and activities of institutions and organizations. The future and development of an organization will depend on the information resources it manages and the guidelines needed to implement them (Agu, 2018). Several studies related to information management in higher education have been carried out, some using the perspective of information technology, its facilities, and even the evaluation of the information management process itself. It is not uncommon for research related to information management to combine its discussion with the roles of other related work units, such as libraries and archives units, especially when the object of research is universities. This article combines the results of an information management evaluation carried out at a university in Indonesia with an ideal and appropriate information management design to be implemented later. Involving roles in other related units and optimizing existing resources are exciting topics discussed in this study.

Method

Research Type

This study adopted a qualitative method with a case study approach. In order to evaluate data and field circumstances as conditions for managing information in higher education, qualitative research was deemed to be the most appropriate method. Qualitative research is used to understand a phenomenon based on the informant's perspective so that it can produce an in-depth description of the reality in the field (Merriam & Grenier, 2019). Meanwhile, a case study approach was required to ensure that each present work activity was correctly interpreted. It is relevant to the case study approach, which is typically employed to discover uncontrollable events or occurrences (Yin, 2014). Data were collected through observation and interviews at work units, which served as information sources. Sections of the faculty administration of UIN Maulana Malik Ibrahim Malang included the Academic Department, the Student Affairs Department, the General Department, the Public Relations Department, and several faculty administration departments.

Research Location

This research was conducted at the Maulana Malik Ibrahim State Islamic University, Malang, involving several related work units as part of this research and informants. The location selection was made considering that this university is one of the three best Islamic universities in Indonesia so that other similar universities can adapt the analyzed information management design. The work units in question include the General Section, Public Relations Section, Student Affairs Section, Administration Section, and several faculties at this university.

Data Collection

The data collection technique used in this research is literature study to find an appropriate information management framework to serve as a preposition in the discussion.

This study's information management design was conceived in accordance with Smallwood (2020). This study has relied heavily on three guiding principles: information integrity, information security and accessibility, and information control. 1) The concept of information integrity refers to the reliability of the processes involved in information creation, maintenance, preservation, dissemination, and monitoring. In order to guarantee that the information under management is high-quality, this topic also covers data governance strategies and the enabling technologies for managing information. 2) Accessibility and security of information refer to the measures taken to protect information from damage, theft, and alteration by irresponsible parties or even unintentional actions. There is a direct relationship between information security and privacy (Smallwood, 2020). 3) Access to documents, including the ability to create, update, and print documents and reports, can be restricted through information control. When a report or other document is designated as an archive, it must be stored in accordance with the retention time established by policy (Smallwood, 2020).

Moreover, data collection through interviews is also used to formulate an appropriate information management design for this university. Some informants were information managers, archivists, administrative officers, and representatives from work units at the State Islamic University of Malang. Representatives from the university's Quality Assurance Institute were also among the informants, especially in terms of ensuring the suitability of the information management process design prepared with work activities and information business processes at this university.

Case Analysis

All data obtained in this research was analyzed using the information management framework proposition. The analysis results are adjusted to the existing conditions at the State Islamic University of Malang so that any existing data findings are adjusted to determine the information management process for this university later. Several propositions are related to information management as an information management process and an organization's information management framework (Smallwood, 2020).

Information management is a series of processes that can support and ensure the sustainability of an organization. This term has been widely used in various sectors of industry, technology, business, including education (Nasir et al., 2020). Managing information and applying it in information systems and services will function effectively for organizations in facing changes in the environment and information technology (Azhar Mohamad et al., 2022). One study that provides a detailed description of the information management process is Arua, who looked at how well the information management process worked at Nigerian university libraries (Arua, 2016). In developing countries like Nigeria, the research revealed that the process of collecting and managing information has become an issue encountered by most institutions, including libraries. Concern has been raised about the inadequacy of information storage and management in Nigeria's educational institutions. Administrators' ability to make sound judgment calls is hindered when they lack adequate access to relevant information. To enhance information efficiency in higher education, librarians or information managers must be able to identify user communities and the information needs of their users, involve qualified staff to manage management information systems, train information professionals, automate libraries, and adopt appropriate information management strategies.

Moreover, Salwa and Gani have also studied the information management process in the corporate sector. The results shed light on the challenges encountered during the rollout of information management at the Republika Data Center (Salwa & Gani, 2019). The findings of this study unveiled that the Republika Data Center has followed a five-step information management process, beginning with the determination of information needs and continuing

through the creation of information services and products, dissemination of information, and its ultimate usage. There were four challenges encountered during the deployment phase: inconsistent naming of newspaper sections, a lack of standard operating processes, poor performance from web-based software, and inadequate space for storing data. Meanwhile, Stone et al. (2018) examined smart city data management systems. The findings uncovered how advancements in information technology could help all participants in a smart city environment with new, interconnected information.

Universitas Islam Negeri (UIN) Malang currently does not have a specialized information management unit. However, an information management unit is needed to develop the information collection itself, manage it, provide access to it, preserve the information, and to be able to adapt technology to support information services later (Hawamdeh et al., 2023). The current information management at UIN Malang is still in the form of recording and storing short-term information only. Every existing data and information is not managed to become long-term information or is not prepared to be found again in the future. A long-term information management design that can be implemented by all work units is ultimately needed so that it can be one of the solutions for an easy information retrieval process and maintenance of the information itself as an institutional asset. After all, information governance is closely related to information management plans that aim to ensure access to reliable, accurate information that enhances the functioning of the organization (Dong, 2016). In contrast to the three studies previously evaluated, this study concentrates on developing a design applicable to the information management process in higher education. In general, information management involves the perception, collection, organization, processing and maintenance of information (Altındağ & Öngel, 2021).

Result and Discussion

Information management in Universitas Islam Negeri Malang

Information management that occurs within the Universitas Islam Negeri Malang currently runs partially, each existing work unit manages information according to the work habits of each unit. There is no mutually agreed framework for the information governance process. This was obtained from the results of observations and interviews of researchers in mid-2022, with several leaders and employees related to administrative management in each existing work unit starting from the General Section, Administration Section, Student Affairs Section, Public Relations Section, administrative managers of the Faculty of Psychology and the Faculty of Science and Technology. One of the results of the interviews conducted was with the Student Affairs Section which does have its own script system for its correspondence documents.

> *"Because we are indeed a service for the children of SME and others, and they are administratively still designed there is their own script system for children. SMEs have different kinds of organizational characters, including different kinds of administration" (Interview with students affair section)*

Manuscript procedures in information management refer to written guidelines on letter numbers, information classification or grouping of a number of document contents, and the procedure for writing each document created by the work unit. Some differences are not only in recording and classifying documents, but the way of working in information management in each unit is also different. When one work unit, for example, stores old documents in a document warehouse by stacking and tying them after being transferred, while other faculties do not transfer document media but store them in storage cabinets with paper folders. Likewise,

with the determination of the shelf life, some work units have different limits on the shelf life of documents.

The statement that each work unit has different needs and therefore manages information differently is contradictory to the reality on the ground, which if allowed to continue will ultimately have an impact on the unstructured governance process and the difficulty of retrieving the information needed. The grouping of different types of documents will hamper the information retrieval process, double identification as a result of document numbering that is not centrally controlled, are some of the impacts that have happened in the field. It is not impossible that important information that should still be needed for a long time is abandoned in the warehouse, making it difficult to retrieve. Meanwhile, information that has been deemed to have no use value is still piled up in the workspace for a long time. A framework and guidelines are clearly needed in this case of information management in higher education.

For example, one of the existing work units is the Student Affairs Section of UIN Malang. Information in the form of letter documents is managed by recording and numbering letters from the student affairs unit itself. The recording process is carried out on Microsoft Excel pages only, without the process of transferring document media, and documents are stored in plastic folders. This simple process is even only done on documents within the last two years. In fact, there are quite a lot of documents in the form of sheets of paper that have important information from this unit, such as cooperation agreement documents, student scholarship letters, space loans for student activities, and others. Efforts to organize good information governance have actually been made by this unit, but it is still limited to information related to scholarships through the Scholarship Information System (SIBEA). Unfortunately, this step is not followed by the management of other information, especially those in the form of paper sheets.

Meanwhile, General Section is another unit in this university. One of the main tasks in this unit is the management of incoming letters and outgoing letters that enter the university to be distributed to the Rector and faculties. In the end, the management of the information contained within will depend on each unit receiving the document or archive. For example, in the case of incoming documents, for example, the General Section receives incoming letters via email related to student affairs, and then the document will be submitted to the Student Affairs Section, as well as if the documents received are related to college finances, the documents will be submitted to the Finance Unit. Meanwhile, for the case of outgoing documents, for example, the Student Affairs Unit wants to issue information in the form of an announcement related to student affairs that requires a letter number, and then the letter number in question will be requested to the General Section without a copy of the letter being given. Another unit that is the study of interviews at the Universitas Islam Negeri Malang is the Public Relations Section. The information management carried out by this section is more about displaying information content related to universities as well as being an intermediary between universities and the public who need related information. This process is carried out by the public relations department through the Information and Documentation Management Officer (PPID) through the official website and social media pages. Although the implementation of public information disclosure is quite late, efforts to realize it have been seen since the end of 2020. It's just that the information management process within the university itself does not yet have the same scheme so that information management, whether in the form of letter documents, archives, or even digital content, is managed partially depending on where the information is located.

Information management will basically depend on the needs of each institution, but management that does not have the same standard provisions will clearly have an impact on the running of the institution, in this case the university. Some of the impacts that occur from these conditions include information being difficult to find, it takes a long time to be able to find the

right information as needed. This is because a person must first understand which unit the information they need is in, and after knowing the unit, it is not certain that the type of information needed can be found again immediately as a result of the location and storage method of each unit is different.

In addition, the absence of a mutually agreed framework means that each management unit will freely manage its information. Free in terms of competing to do the best governance is certainly not a problem; the concern that each unit will neglect its information is clearly one of the impacts that will also occur. Not without reason, this concern has been found in several work units and also the faculty administration section which until now still stores files in inappropriate places such as tied files, stacked in cabinets, or stacked in warehouses. Information files that are owned both in the form of print and non-print are stored according to the capacity of the storage cabinet only, when it no longer meets the storage space, it is immediately transferred to another place without considering its validity period (retention). Some documents may even be kept personally by the officer on duty at the time.

Information management design

Based on the existing conditions at the Universitas Islam Negeri Malang, an information management design is needed that can be applied in this university environment. The information management design is compiled into a business process flow that needs to be implemented by involving the division of roles and work in related units. After all, this university does not lack an institutional organizational structure, it just needs a role in every work process that is agreed upon and implemented together by all existing units. Figure 1 is a flow of information management business processes consisting of 6 steps, namely: collection, processing, presentation, delivery, storage, and destruction.

The first stage, namely collection, is a stage where all existing units are required to collect various types of data, both self-generated (created), as well as those submitted to the unit or received by each unit. Although the Universitas Islam Negeri Malang does not have a special unit for archive and documentation management, the part that handles the university archives as a whole is in the General Department. This section can be given the task of collecting if there is data in the form of static archives. Likewise, other universities or institutions that do not have a special unit for archives and documentation management can delegate this task to certain sections or work units that manage administration or the general section. Data collection will be related to data processing, data quality, and also data privacy (Al Haddad & Antoniou, 2022). Therefore, this initial stage needs to be carried out carefully to determine whether the information can be of value to the organization or not.

In the information management design created, the collection step also involves all administrative personnel in each work unit and also archivists. This means that this process needs to be carried out by each work unit in the institution. In addition, the role of volunteers is also needed in the information collection process; this is related to efforts to accelerate data collection for the General Section, which functions as the central archive and documentation manager at the university. The volunteers in question will help collect documents scattered throughout the university work units that have long-term information value and still need to be stored. Some suggestions related to the volunteer in question can be in the form of interns or students who have been briefed and explained beforehand by the information manager and archivist in the General Section.

Referring to Robert Smallwood's principles of information governance, this initial stage of collection also needs to consider the consistency of data and information collection, which means that this process needs to be carried out on an ongoing basis for every activity in the work unit. Information integrity is a consideration of the consistency of the methods used to

create information, maintain, preserve, disseminate information and track it. This also means that there needs to be a guarantee that the information held by the institution is accurate, true and authentic. In practice, information integrity also includes the process of eliminating redundant data (duplication) and maintaining unique data to reduce risk, reduce data storage costs, and resource costs including the aim of providing accurate and reliable information for decision makers. Audit results should be stored and monitored, it is to ensure compliance with information governance as well as to ensure that information integrity is maintained (not altered, tampered with, or deleted) (Smallwood, 2020).

The second stage is processing, where all units that have collected information are required to carry out management steps starting from recording (using applications or recorded in a wide spread device), classifying or grouping types of information (based on the guidelines for official manuscripts owned by universities), transferring media, and storing in each work unit (adjusted to the form of information, printed or digital). In order for this storage process to be carried out equally between existing work units, a document or guideline for storing information based on its type and form is also needed. At this stage, it is clear that several related documents are needed that must be approved by the highest leadership at the university so that all work units can be guided together. The relevant documents in question are in the form of official script guidelines, Standard Operational Procedures (SOPs), and also regulations related to record and archive management. The issuance of guidance documents related to information processing will clearly have an impact on the work process that is simultaneously carried out and the same by all existing work units. The information retrieval process, however, is also influenced by the source of the information itself, how the information is organized, the accuracy, completeness and ease of information services (Hu et al., 2019). Therefore, the existence of information management guidelines that are carried out simultaneously clearly facilitates the retrieval process later.
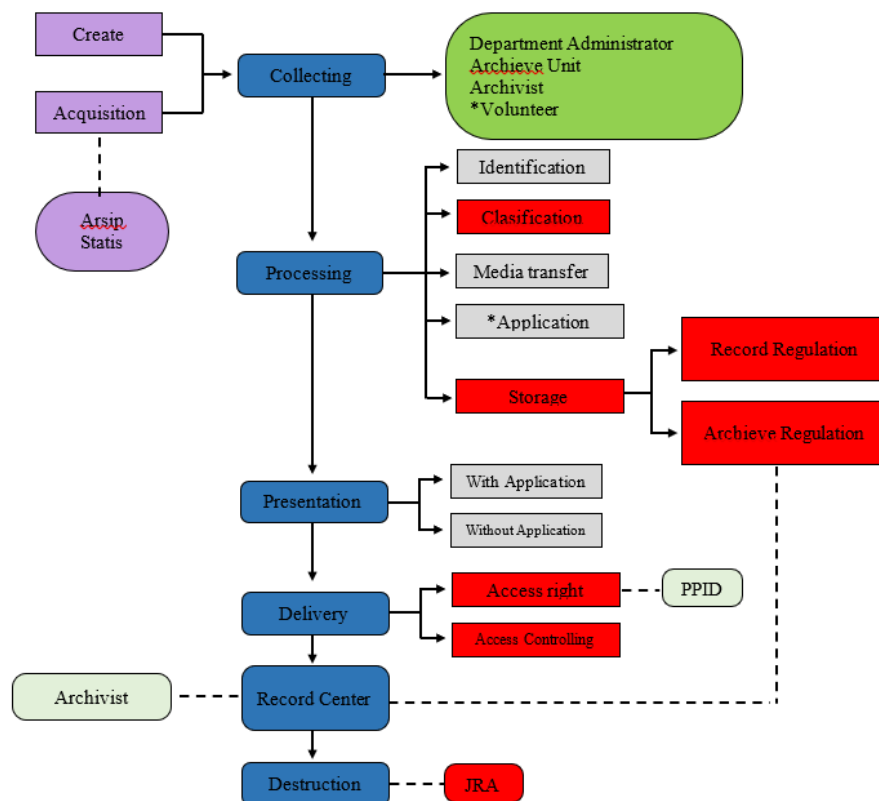

Figure 1. Information Management Design at Universitas Islam Negeri Malang

The next stage is presentation and delivery, where all data and information that has been processed must be presented to the public as mandated in the public information disclosure regulation. After all, higher education institutions are included in public institutions that must be able to present information in accordance with their restrictions and access rights. Ineffective delivery of information will disrupt the decision making process, and also affect the process of maintaining the information itself (Chen & Tsai, 2021). At this stage it is also necessary to consider the implementation of measures to protect information from damage, theft, changes by irresponsible parties or even protect information from accidental actions. Information security can use information technology with access control methods, encryption of information, use of information rights management software, implementation of audit procedures, and remote digital shredding. Information security is also closely related to information privacy (Smallwood, 2020). Similar to information security, information accessibility is also very important both in the short and long term. The availability and accessibility of information is an important factor in obtaining new sources of data and knowledge for its users (Abubakar, 2020). Long-term accessibility of information can use long-term digital preservation techniques. Information accessibility includes making information easy to find and easy to access, basic access controls such as password management, identity and access management, and sending information across multiple hardware devices (Smallwood, 2020). In the future, all data can be displayed through applications or web pages with certain access restrictions with the division of tasks can be given to the Public Relations Section of UIN Malang as the front guard of information presenters. In this section, access control will be an important part, especially in terms of information security. Another term for access control is authorization. Authorization in a technological system shows that a request for access to an information source is rejected or accepted (Penelova, 2021).

Regarding to information control and access rights, the Public Relations Department also needs to coordinate with all work units in the university to make efforts to control outgoing documents. The university needs to make a collective agreement on what information is freely accessible to the public, what information can be accessed with certain conditions and periods, and what information can only be accessed by the internal university environment. Therefore, if an institution already has an Information Documentation and Management Officer (PPID), then this section needs to be involved in the coordination process later.

The fifth stage is final storage, different from the storage process in the processing stage, where the storage in question is carried out by each existing work unit. The storage stage in this fifth stage is the final storage carried out by the archivist or in this case the General Section of UIN Malang. Then finally at the destruction stage, the whole process is the responsibility of the archivist owned by the university in coordination with the National Archives of the Republic of Indonesia. This needs to be done because the process of destroying public institutions or state institutions must obtain written approval from ANRI (Arsip Nasional RI, 2016). This whole series still requires a control or what is called information control which is used to control access to documents, both the creation, updating, and printing of documents and reports. When a document or report is declared an archive, it must be assigned a retention schedule by complying with the retention period according to the guidelines (Smallwood, 2020).

Conclusion

The information management design made has considered the situation and working conditions at the Universitas Islam Negeri Malang. Implementing an information management framework in the design of information management for higher education institutions is an essential input for higher education institutions in carrying out the information management process in the future. Of course, adjustments are made according to the condition of the

university's resources. Other universities with structures and resources similar to the State Islamic University of Malang could also adapt this management information design. The absence of a special unit for managing archives and documentation should not hinder or make the information management process in the institution not optimal. Utilizing work units that can play a role as their function such as the General Section and the Public Relations Section, the information management process should still be carried out properly.

An information management design produced in this research requires further study, especially in implementing related tools in the form of an integrated information portal that can integrate all information held by universities. The existence of this portal will facilitate access while limiting access to certain information that is considered vital. This integrated portal also makes all work units in higher education optimal in their role in every information management process. Study programs, faculties, work units in each field, libraries, and archives managers can be integrated with every information management process. However, a strong commitment from all work units to be able to implement this process flow of information management activities, as well as the role of high-ranking position holders, is the key to good information governance in higher education.

Acknowledgments

Authors' Contributions

All authors have contributed to the final manuscript. The contribution of all authors: conceptualization, methodology, formal analysis, writing original draft preparation, writing review and editing. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

All authors have no conflict of interest related to this study.

Funding

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