

## Digitalizing the Archive: Solving Record Problem in Rural Area through Digital Transformation

\*Ahmad Baihaqy<sup>1</sup>, Vinza Hedi Satria<sup>2</sup>

<sup>1</sup>Management, Sekolah Tinggi Ilmu Ekonomi Indonesia Surabaya, Jl. MenurPumpungan No.30, Menur Pumpungan, Kec. Sukolilo, Surabaya, Jawa Timur, 60118

<sup>2</sup>Management, Sekolah Tinggi Ilmu Ekonomi Indonesia Surabaya, Jl. MenurPumpungan No.30, MenurPumpungan, Kec. Sukolilo, Surabaya, Jawa Timur, 60118

\*correspondent author

**Abstract:** Archival documentation is a crucial aspect of administrative departments. Archive records serve the purpose of providing staff members with information about past and recent activities that may be significant for future events. However, the task of maintaining archive records poses several challenges. An investigation was conducted to explore the utilization of archive records in one of a rural area in Indonesia. The research revealed that paper-based archive records were utilized within the village's administration. Over time, these paper records tend to deteriorate, necessitating the rewriting of entire records when this occurs. To address this problem, the research proposed a solution. By interviewing the village's administration staff, the research team suggested the development of a system to digitize the archive records for incoming-outgoing letter and for resident's ID. The research did not conclude solely upon the creation of the system. Documentation of the system and training staff members also conducted, ensuring the effective utilization of the system. Usability testing was employed to assess the system, with village's administration staff participating as respondents. The test indicated that the system was easy to use to assist the village's administration in tracking both resident and incoming and outgoing letters to and from the village.

**Keywords:** Sustainable Development Goals, Women, Rural Area

### 1. Introduction

Recorded information has the capacity to provide valuable insights into numerous past events. For instance, historical records offer modern individuals a glimpse into their ancestral heritage and the processes that shaped their nation. The recorded data of a patient's health condition can be utilized to inform future treatment considerations [1], [2]. While the importance of recorded information is no longer a subject of debate, the preservation of these records poses a significant challenge. The majority of existing records have already been digitized [3], [4]. But what about record in the rural area? Moreover, if the record is still being kept using analog method (for example: using paper-based record) that have its own disadvantage.

In Indonesia, it is estimated that 8.82 percent of households in rural areas owned and used computers as of 2021, according to the Indonesian Central Statistics Agency [5]. The number of households in rural areas owning and using computers has shown a slight decline compared to the previous years of 2020 and 2019. The year-by-year data is presented in Figure 1 below.

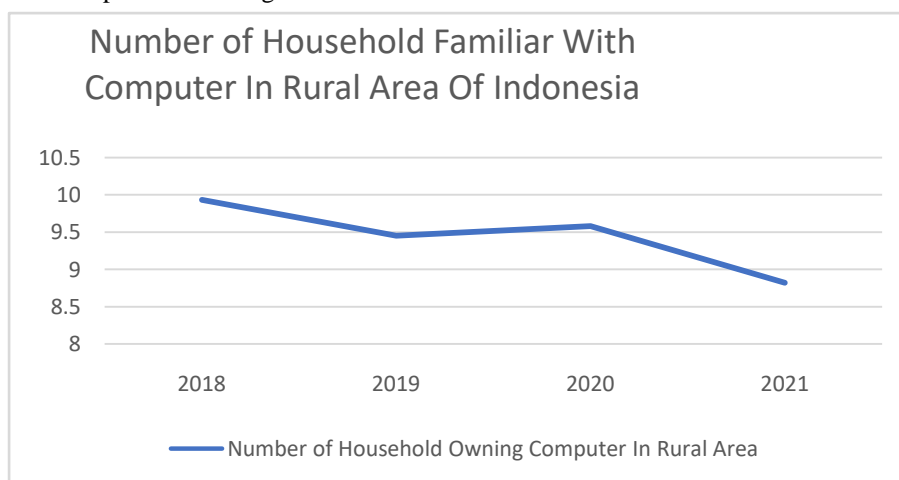


Figure 1: Representation of Household Familiar With Computer In Rural Area In Indonesia [source [5]]

Among all the provinces in Indonesia, Jawa Timur stands out as one of the provinces experiencing a consistent decline in the number of households in rural areas who are familiar with computers. In 2018, approximately 18.57 households in rural areas of Jawa Timur were familiar with computers. However, this number decreased to 16.38 by 2021 [5].

Due to the limited usage of computers across the province's rural areas, most activities, including archival recording, rely on analog methods. However, this approach poses a slow but steadily growing risk, as paper-based records gradually deteriorate over time. As a consequence, archival records become unreadable, leading to an inability to comprehend previously recorded events.

The digitalization of archive records has emerged as a viable solution to address the challenges faced in rural areas. The digitalization in general terms, offer numerous benefits [6] In the rural areas this digitalization also offer advantage [7], however the implementation of digitalization in rural and urban held different challenge. Unlike urban areas that possess cutting-edge technology [8], [9], [10]rural areas face physical and cultural barriers that distinguish their resident [11] These factors contribute to the perceived proximity of solutions becoming distant. However, while not impossible, implementing digitalization in rural areas requires additional steps to not only digitize the recording process but also ensure the adoption and usage of the system. Otherwise, there is a risk that the system may not be utilized over time, reverting back to analog paper-based methods."

## **2. Identifying the Problems**

Based on the previous section, a problem has been identified, and it requires further action. Therefore, a study will be conducted to address the mentioned problem through a community service initiative in a rural village located in Jawa Timur, which exhibits a declining trend in computer usage. Although other provinces may also experience similar trends, Jawa Timur was selected for this study due to its geographical location.

The conducted study will have two main objectives:

1. Digitalizing the archival process in the village's administration with system.
2. Teaching the village's administration staff on how to use the system.

The problem did not only lies in digitizing the records, the staff who will uses digitized record will also require training to adapt with the new system [12]. Thus, the second objective of the research will focused on how to teach the staff.

The study will be structured into five main sections. Firstly, the Introduction section will provide an overview of recent events and identify the specific problem that will be addressed in the study. Secondly, the purpose of the study will be defined, focusing on solving the identified problem. This will be elaborated upon in the third section, Method, where the approach and methodology used to achieve the study's objectives will be outlined. The fourth section will present the results of the study, accompanied by a thorough discussion and analysis of the findings. Lastly, the final section will provide a comprehensive summary of the entire study, including possible directions for future research and recommendations.

## **3. Method**

A Software Development Life Cycle (SDLC) model has been adopted and modified [13] to align with the objectives of the study. The specific details of the research methodology can be observed in Figure 2 below, providing a concise summary of the study's method.

The first process involves conducting interviews with the village's administration staff to gain an understanding of their software and hardware needs. It is crucial to only include necessary features in order to minimize the effort required for the village's administration staff to learn the created system. The interviews will specifically focus on the administrative processes within the village's administration. Once the interviews are completed and a list of requirements is obtained, the study will proceed to develop the system for digitizing the archival process. This step involves designing and implementing the system based on the identified needs. The third process entails conducting training sessions for the system. Selected staff members will receive guidance on how to use the system effectively. This step is essential to ensure the system's utilization once the study is concluded. Following the training, usability testing will be conducted. This testing will involve certain village's administration staff, not just those who have mastered the system. The usability testing aims to provide insights into user comfort and satisfaction while using the system. The last process involves documentation and the provision of frequent error support. Documentation will consist of step-by-step instructions on how to use the system, while frequent error support will anticipate potential issues and offer troubleshooting guidance. These resources will assist in resolving any problems that may arise after the community service period concludes.

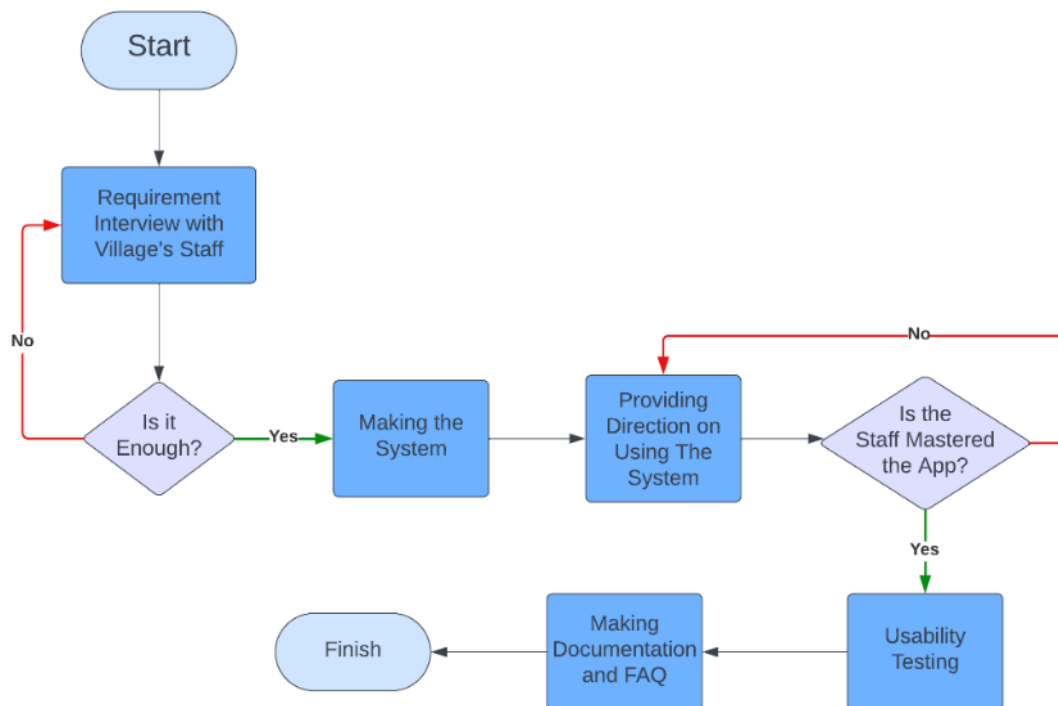


Figure 2: Study's Method

### 3.1 Requirement Interview

To determine the requirements for the study, interviews were conducted with the staff members of the village's administration. The administration staff team is comprised of five individuals, and their details are provided in Table 1 below.

Table 1: Detail of The Staff

Respondent	Age	Gender	Role in Village's Administration	Familiar With Computer?
First Staff	56	Male	Senior Staff - Decision Maker	No
Second Staff	51	Male	Senior Staff – Event's Administration	No
Third Staff	28	Male	Junior Staff – Village's Owned Enterprise Administration	No
Fourth Staff	26	Male	Junior Staff - Villager's Administration	Yes
Fifth Staff	21	Male	Junior Staff - Villager's Administration	Yes

In the village's administration office, there are five staff members who have varying ages and levels of experience in using computers. Each staff member has specific duties related to village administration. Notably, all of the village's administration staff are male, which aligns with the findings mentioned in a previous study conducted by [14] that highlighted the declining female work participation in rural areas.

Among the five staff members, the main contacts for the current study are the fifth and fourth staff members, with the fourth staff member having a moderate level of interaction. The first staff member, who serves as the decision maker for the village's administration, delegates the responsibility for the current study to the fifth staff member. Meanwhile, the second and third staff members have different areas of work and were busy at the time of the interview. Consequently, the interviews were conducted with the fifth and fourth staff members acting as clients. In addition to the interview regarding the processes requiring digitalization, an interview related to the available hardware required for the system was also conducted.

### **3.2 Making The System**

Once the list of requirements is gathered, the next step is to develop the system. The designed system will be implemented as a web-based application. It is important to note that the system does not require an internet connection to function. However, opting for a web-based system offers several advantages for future updates, such as the flexibility to switch devices (e.g., from PC to mobile) and utilize cloud services. The web platform provides numerous benefits that have transformed industries not only in rural areas but also worldwide [15]

### **3.3 Providing Direction on Using The System**

At this phase, the pre-developed system has been installed. The subsequent step involves conducting the training phase, wherein the created system will be taught to the fifth staff member. The training will utilize the method of task analysis [16] Before the test begin, a comprehensive list of tasks that need to be accomplished by the trainee is generated. The training sessions will continue until the fifth staff member has attained mastery of the system. The training primarily focuses on the fifth staff member since fifth staff will be the primary operator of the system once the study is completed.

### **3.4 Usability Testing**

Once the training phase is completed, the next step is to conduct usability testing. Usability testing aims to provide insights into the comfort and user-friendliness of the application [17], [18] The questions used in the usability testing will be adopted from the System Usability Scale [19], [20]. Since the fifth staff member has already mastered the application after the training phase, potential biases in the testing results are taken into consideration.

To ensure unbiased results in the usability testing, participants will be expanded to include all junior staff members of the village's administration. This means that the participants will not only consist of the fifth staff member but also the third and fourth staff members. Initially, the usability test was proposed to all members of the village's administration. However, the first and second staff members declined to participate, resulting in only the junior staff of the village's administration becoming the participants in the usability test.

### **3.5 Documentation and Frequent Errors**

After the completion of the training and usability testing phases, the village's administration is provided with a comprehensive system documentation and frequent error guide. These documents serve multiple purposes. Firstly, the document can be used for self-troubleshooting and as training modules for future village staff members once the study concludes. Secondly, the documents serve as a memento, capturing the efforts and accomplishments of the study. The system documentation contains detailed instructions on how to use the system, offering step-by-step guidance for various tasks and operations. Meanwhile, the frequent error guide provides anticipated errors and troubleshooting steps to address potential issues that may arise during system usage. The provided documents ensure that the knowledge and understanding gained during the study are preserved and can be utilized beyond its duration. These documents serve as valuable resources for ongoing support and future training needs.

## **4. Result and Discussion**

As depicted in Figure 2, the current study comprises five main processes. In addition to the documentation phase, the results of each process conducted in the study will be presented and thoroughly discussed.

### **4.1. Result of The Interview**

From the interview conducted, a list of requirements pertaining to the village's administration process has been compiled. This list identified two main processes that require digitalization, each with several sub-functions:

1. Incoming and Outgoing Letter Archival: Add Incoming Letter, Add Outgoing Letter, Search Archived Letter (Incoming and Outgoing)
2. Villager's Administration: Add New Villager, Edit Passing Status to Villager, Edit Moving Status to Villager, Edit Villager's Family Member.

The first requested function is the archival of incoming and outgoing letters. During the interview, the fifth staff mentioned the significant volume of letters that are received and sent from the administration office. Consequently, a proper archival system is required to manage this process. Prior to the study, the archival process was conducted manually using record books. However, this approach posed several challenges in the

long run. Not only was there a risk of losing archives due to paper deterioration, but the accumulation of record books also started to occupy valuable space in the office. To address these issues and improve the efficiency of the archival process, the study aims to develop a digitalized system that can effectively store and retrieve incoming and outgoing letters, thereby eliminating the need for physical record books.

In contrast to the first function, the second requested function is associated with villager's administration. Prior to the study, the administration staff faced difficulties in keeping track of villagers who moved away, got married, or passed away. To manage these processes, the staff utilized data processing programs such as Excel. However, due to the substantial amount of data and frequent changes, the staff found it overwhelming to maintain accurate records even with the assistance of a program.

To address this challenge and enhance the efficiency of villager's administration, the study aims to develop a digitalized system that can effectively track and update the status of villagers. This system will provide a centralized and streamlined approach to manage the dynamic nature of these administrative processes. An interview related to hardware requirement that available in the village's administration office also being held with result as shown in table 2 below:

Table 2: Hardware Requirements

System Requirement	Availability	Dependency
Main Computer Unit	Available (2)	High
Printer	Available	Optional
Internet	Available	Low

Based on the interview, a list of available hardware in the village's administration office has been compiled. The office has two main computer units, one assigned to the first staff and the other designated for general use. The system created for the study will be installed on the second computer. Additionally, there is a printer available in the office for general purposes. While the system is not specifically designed to rely on a printer, the data within the system can be exported into a format that can be printed. This allows for the utilization of the printer when needed, providing an additional benefit to the system. Internet access is available in the office, although with a middle to low quality connection. As a result, developing a system that depends heavily on the internet may pose difficulties at the moment. However, it's important to consider the potential for improved infrastructure in the future. For the current study, the system will be implemented on the local network to ensure accessibility and ease of upgrading. To facilitate easy access and potential future upgrades, an open web-based application will be utilized to build the system, ensuring compatibility and flexibility.

#### 4.2. Result of The System

The system is developed using HTML5, CSS, and JavaScript, making it a web-based application. However, it is important to note that the system will primarily operate within the local network, reducing the dependency on internet connectivity. The system will be installed on the computer within the administration's office, ensuring easy access and utilization. The system is referred to as SIADES, which stands for (Sistem Informasi Administrasi Desa) or Village Administration Information System. This system is designed to streamline and enhance various administrative processes within the village's administration.

Figure 3 provides an example of the system's interface and showcases the various functions and features available in the system. It serves as a visual representation of how the system will look and the capabilities it offers to the users. The interface are written in Bahasa Indonesia language since the system are designed to be used by the staff of village's administration.

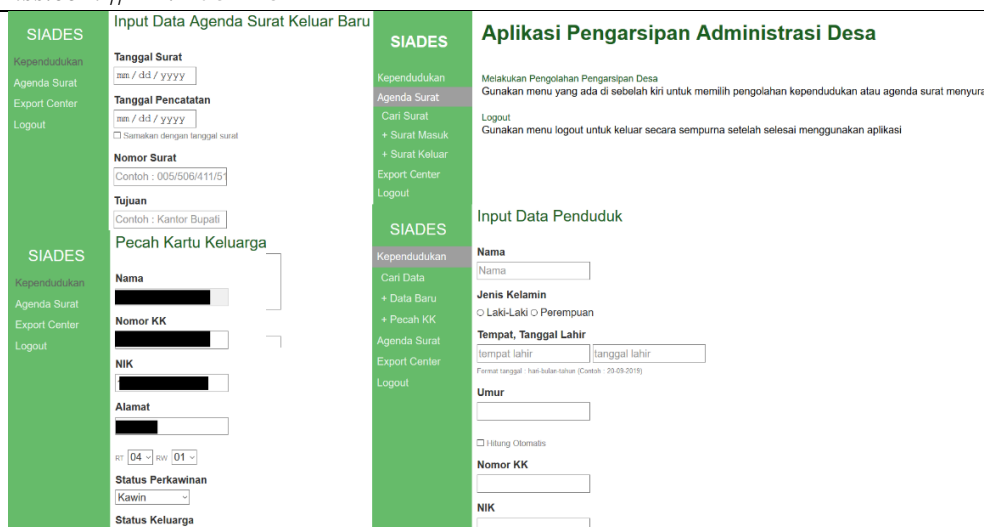


Figure 3: Example of The System

### 4.3. Direction on Using The System

Once the system is installed, a comprehensive training program will be conducted to enable the trainee to master the application. The training involves a series of tasks that the trainee needs to accomplish. The trainee's proficiency in using the application will be determined by their ability to complete all of these tasks without any guidance or instruction. Table 3 provides a detailed list of tasks that the trainee must perform during the training process.

Table 3: List of The Task

Name of Task	Task To Do	Name of Task	Task To Do
Adding New Resident	Click "Kependudukan"	Adding New Incoming Letter	Click "Agenda Surat"
	Click "Tambah Data Baru"		Click "Tambah Surat Masuk"
	Fill Form		Click "Tambah Data Baru"
	Click "Submit"		Fill Archival Form
Search Resident	Click "Kependudukan"		Click "Simpan"
	Click "Cari Data"	Click "Agenda Surat"	
	Write "NIK" or Name in Search Bar	Click "Tambah Surat Keluar"	
	Click searched resident's name	Click "Tambah Data Baru"	
Edit Resident Data (Moving or Passed Away)	Click "Kependudukan"	Fill Archival Form	
	Click "Cari Data"	Click "Simpan"	
	Write "NIK" or Name in Search Bar	Click "Agenda Surat"	
	Click resident's name	Click "Cari Data"	
	Click the Edit icon	Fill the bar with searched letter	
	Edit the data	Click the searched letter	
Edit Resident Data (Separation from Family Due To Marriage)	Click "simpan"	Search Incoming / Outgoing Letter (Method of Search Bar)	Click "Agenda Surat"
	Click "Kependudukan"		Click "Cari Data"
	Click "Cari Data"		Fill the bar with searched letter
	Write "NIK" or Name in Search Bar		Click the searched letter
	Click resident's name	Search Incoming / Outgoing Letter (Method of Date)	Click "Agenda Surat"
	Click the "Pecah KK" Icon		Click "Cari Data"
Edit the NIK Form	Fill the searched period		
Click "Simpan"	Click the searched letter	Edit Incoming / Outgoing Letter	Click "Agenda Surat"
	Click "Cari Data"		Click "Agenda Surat"
	Search the letter		Click "Cari Data"
	Click the searched letter		Click the searched letter
	Click "Simpan"	Click "Edit" Icon	

Export Resident's Data to Excel	Click "Export Center"	Export Archived Letter Data To Excel	Edit the letter's detail
	Click "Export Data Kependudukan"		Click "Simpan"
	Click "All Data"		Click "Export Center"
	Click Export		Click "Export Data Surat"
	Open The Excel File		Fill the wanted period of letter
			Click Export

During the training phase, feedback was collected from the fifth staff, which proved to be valuable for further improvement of the system. While the staff expressed satisfaction with the application, a request is raised to integrate the data from the proposed system with the existing system in a spreadsheet format. To address this request, the proposed system has been enhanced to include export capabilities, allowing users to generate spreadsheet documents for physical print-outs of the data. Additionally, an import feature has been developed to facilitate the integration of data from the spreadsheet format into the proposed system. The import process follows a similar approach to the export process. Users will need to provide a spreadsheet file as input in the import system, and the proposed system will automatically read and input the data into the appropriate sections of the system. By incorporating this import feature, the proposed system becomes more versatile and enables seamless data transfer between different systems, ensuring efficient data management and continuity.

#### 4.4. Usability Testing

Usability testing is a crucial step to evaluate the comfort and user-friendliness of the program. In this study, usability testing will be conducted with the participation of the third, fourth, and fifth staff members of the village's administration. The participants will be assigned tasks that are similar to the ones given during the training phase. These tasks are designed to cover various functions and features of the system, allowing the participants to navigate and interact with the program. Table 4 provides a coding system that correlates each task from Table 3 with a unique code. This coding system helps track the completion of tasks during the usability testing phase and facilitates data analysis.

Table 4: Code of Task

Code of Task	Name of Task
A1	Adding New Resident
A2	Search Resident
A3	Edit Resident Data (Moving or Passed Away)
A4	Edit Resident Data (Separation from Family Due To Marriage)
A5	Export Resident's Data to Excel
B1	Adding New Incoming Letter
B2	Adding New Outgoing Letter
B3	Search Incoming / Outgoing Letter (Method of Search Bar)
B4	Search Incoming / Outgoing Letter (Method of Date)
B5	Edit Incoming / Outgoing Letter
B6	Export Archived Letter Data To Excel

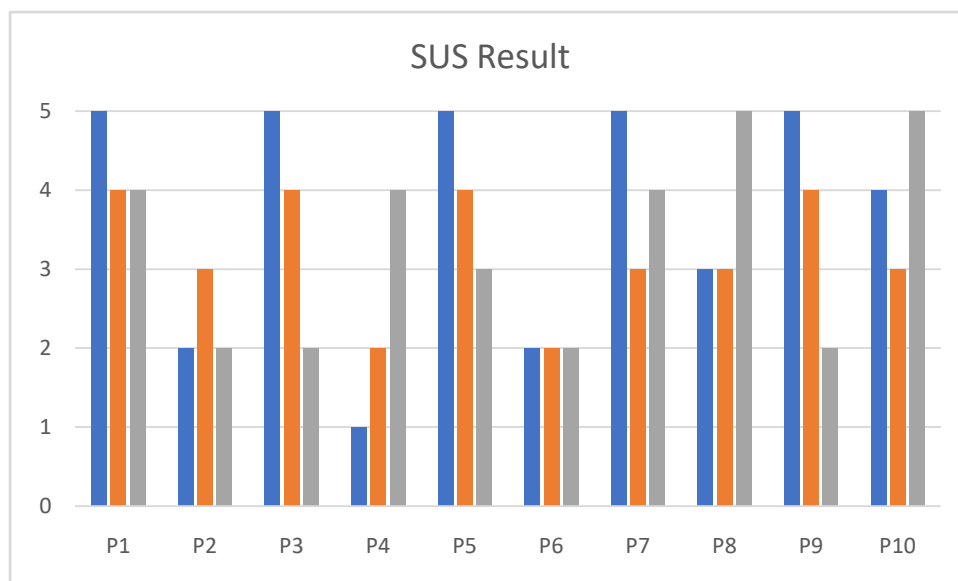
During the usability testing, each participant was given unlimited time to complete the assigned tasks. However, the time taken to finish each task was still recorded for data analysis purposes. Once the participants decided to start the test, participants were not allowed to take any breaks until the test was completed. This measure was implemented to ensure that the participants remained focused throughout the duration of the test. A member of the study team acted as a timekeeper during the test, monitoring the time taken for each task without providing any further instructions or assistance to the participants. The participants relied solely on the instructions provided in Table 3 to guide their actions and interactions with the system. It's important to note that the instructions for the usability testing, including the task descriptions, were written in Bahasa Indonesia to accommodate the participants' language proficiency and ensure clear understanding of the tasks.



After completing the assigned tasks, participants were requested to fill out the System Usability Scale (SUS) form using a Likert scale ranging from 1 to 5. The scale was anchored with 1 indicating "strongly disagree" and 5 indicating "strongly agree." The SUS form consisted of the following questions in table 4:

**Table 4:** Learnability Aspect Script (source: [19] )

No	Original Item
1	I Think that I would like the system
2	I found the system unnecessarily complex
3	I thought the system was easy to use
4	I Think that I would need support of technical person to be able to use this system
5	I found the various function in the system were well integrated
6	I thought there was too much inconsistency in this system
7	I would imagine that most people would learn to use this system very quickly
8	I found the system very cumbersome to use
9	I felt very confidence using the system
10	I need to learn a lot of things before I could get going with this system



**Figure 4:** Result of The System Usability Scale

On the other hand, the second and third participants demonstrated a more varied response regarding the usability of the system. Overall, the second participant did not encounter significant difficulties while operating the system, as indicated by their neutral to disagree responses for questions with negative impacts, such as question numbers two, four, six, and eight. However, compared to the first participant, the second participant expressed lower levels of confidence in using the application and reported less affinity towards it.

In contrast, the third participant obtained the lowest scores compared to the previous two participants. The third participant expressed low confidence in using the system and required technical assistance. Staff encountered several difficulties while operating the system and needed to learn various aspects of it. Despite these challenges, the third participant expressed a positive attitude towards the system and believed that others would find it easy to learn.

The results of the usability testing can be summarized based on the feedback from the three participants. Overall, the participants expressed a positive attitude towards the application, as evidenced by the absence of



neutral to strongly disagree responses for the first question. In response to the second question about the system's complexity, most participants disagreed, although a few participants responded with neutral, indicating that there may be some areas of unnecessary complexity that did not significantly impact their experience.

Regarding ease of use (third question), except for the third participant, the remaining participants agreed that the system was easy to use, with responses ranging from agree to strongly agree. However, only the third participant agreed that assistance is required when operating the system (fourth question). For the fifth question, most participants agreed that the system was well-integrated, which may be attributed to the newly introduced import and export features.

In terms of system consistency (sixth question), all participants agreed that the system was consistent, both in terms of user interface and data representation. The eighth question asked about the system's complexity, with the first and second participants agreeing that it was neither complicated nor simple. The first participant mentioned that the complexity may arise from the import feature, which requires adhering to a specific format. However, the third participant felt that the system was very complicated to operate.

Regarding confidence in using the system (ninth question), the first and second participants expressed high levels of confidence, while the third participant did not share the same sentiment. On the final question, the first and third participants agreed that learning many things was necessary before using the system. This could be attributed to the first participant undergoing training before using the application, while the third participant had a different background and experience.

Despite the differences in background and experience, all feedback from the participants was considered, and minor revisions were made to the system. Some of these revisions included increasing the size of buttons and extending the search bar, among others.

In summary, the system created for the village's administration is highly comfortable to use, and at least one staff member has mastered it. This ensures that the system can continue to be operated effectively even after the community service period ends. The system addresses the challenges of letter archival and resident administration processes, improves data management, and provides a user-friendly and integrated solution. Overall, the study has successfully met the needs of the administration office and established a sustainable digital solution.

### **Conclusion and Future Work**

The first objective of the study, which is to digitalize the archival process in the village's administration, has been successfully achieved through the implementation of SIADES (Sistem Informasi Administrasi Desa). This system not only digitizes the archival process but also ensures usability and comfort through the conducted usability testing. Although the system operates on a local network due to limited internet access, it can be upgraded in the future to accommodate advancements in technology infrastructure. Overall, the study has effectively addressed the objective of digitalizing the archival process and has laid the foundation for potential future enhancements.

The second objective of the study was to educate the staff of the village's administration on operating the system and promote a self-sustaining system beyond the community service period. This objective has been accomplished through the implementation of a training session for the administration staff. Due to variations in job responsibilities, not all staff members were trained during the study. However, one staff member was extensively trained until able to master the system, ensuring continuity and capability to operate it after the study concluded. In addition, documentation and error records were provided to the village's administration, serving as both a memento and a training module for future use and self-troubleshooting purposes. By achieving this objective, the study has empowered the administration staff to independently utilize and maintain the system effectively.

During the study, certain events and potential problems were identified that warrant further investigation. Firstly, due to infrastructure limitations, the system was restricted to running on a local network, which limited the accessibility of the web-based application. However, future upgrades could enhance system accessibility and incorporate features from the previous system. Secondly, while data integration for village residents was achieved through the import function, the archival process for letters still relied on manual methods. Given the increasing focus on digitizing paper-based records, there is potential for automating this process entirely using computer systems in the future.

### References

- [1]. A. Callahan, N. H. Shah, and J. H. Chen, "Research and Reporting Considerations for Observational Studies Using Electronic Health Record Data," <https://doi.org/10.7326/M19-0873>, vol. 172, no. 11, pp. S79–S84, Jun. 2020, doi: 10.7326/M19-0873.
- [2]. V. L. West, D. Borland, and W. E. Hammond, "Innovative information visualization of electronic health record data: a systematic review," *Journal of the American Medical Informatics Association*, vol. 22, no. 2, pp. 330–339, Mar. 2015, doi: 10.1136/AMIAJNL-2014-002955.
- [3]. H. Heslop, S. Davis, and A. Wilson, "An Approach to the Preservation of Digital Records - Green Paper," 2002.
- [4]. U. Schnars and W. P. O. Jüptner, "Digital recording and numerical reconstruction of holograms," *Meas Sci Technol*, vol. 13, no. 9, p. R85, Aug. 2002, doi: 10.1088/0957-0233/13/9/201.
- [5]. Badan Pusat Statistik Indonesia, "Statistik Telekomunikasi Indonesia 2021," 2021. Accessed: Jun. 21, 2023. [Online]. Available: <https://www.bps.go.id/publication/2022/09/07/bcc820e694c537ed3ec131b9/statistik-telekomunikasi-indonesia-2021.html>
- [6]. K. Shaposhnykov, S. Filyppova, D. Krylov, K. Ozarko, M. Yudin, and O. Biliaze, "INNOVATIVE DEVELOPMENT OF ENTERPRISES IN THE CONTEXT OF DIGITAL TRANSFORMATIONS OF THE INSTITUTIONAL ENVIRONMENT OF THE NATIONAL ECONOMY," *Management Theory and Studies for Rural Business and Infrastructure Development*, vol. 45, no. 3, pp. 233–241, Sep. 2023, doi: 10.15544/MTS.2023.23.
- [7]. R. Ramsden, R. Colbran, E. Christopher, and M. Edwards, "The role of digital technology in providing education, training, continuing professional development and support to the rural health workforce," *Health Educ*, vol. 122, no. 2, pp. 126–149, Mar. 2022, doi: 10.1108/HE-11-2020-0109/FULL/XML.
- [8]. J. Räisänen and T. Tuovinen, "Digital innovations in rural micro-enterprises," *J Rural Stud*, vol. 73, pp. 56–67, Jan. 2020, doi: 10.1016/J.JRURSTUD.2019.09.010.
- [9]. M. Trendov, S. Varas, and M. Zeng, "Digital technologies in agriculture and rural areas: status report.," *Digital technologies in agriculture and rural areas: status report.*, 2019.
- [10]. O. Lozhachevskaya et al., "TECHNOLOGICAL MANAGEMENT OF INNOVATIONS IN LOGISTICS," *Management Theory and Studies for Rural Business and Infrastructure Development*, vol. 45, no. 2, pp. 113–123, Jun. 2023, doi: 10.15544/MTS.2023.12.
- [11]. P. Cowie, L. Townsend, and K. Salemin, "Smart rural futures: Will rural areas be left behind in the 4th industrial revolution?," *J Rural Stud*, vol. 79, pp. 169–176, Oct. 2020, doi: 10.1016/J.JRURSTUD.2020.08.042.
- [12]. I. Buleev, N. Bryukhovetska, T. Korytko, S. Piletska, and V. Patlachuk, "EVALUATION OF THE LEVEL OF PERSONNEL ADAPTATION TO ENTERPRISES INTELLECTUALIZATION IN TERMS OF THE ECONOMY DIGITALIZATION," *Management Theory and Studies for Rural Business and Infrastructure Development*, vol. 45, no. 1, pp. 94–104, Mar. 2023, doi: 10.15544/MTS.2023.10.
- [13]. R. Parlita, M. F. Hidayat, H. R. Putra, V. H. Satria, H. F. Lesmana, and F. H. Pralas, "Studi Komparatif Model Proses Perangkat Lunak Terhadap Karakteristik Sistem ERP," *Jurnal IPTEK*, vol. 22, no. 2, pp. 1–8, Dec. 2018, doi: 10.31284/J.IPTEK.2018.V22I2.252.
- [14]. S. Desai and O. Joshi, "The Paradox of Declining Female Work Participation in an Era of Economic Growth," *Indian Journal of Labour Economics*, vol. 62, no. 1, pp. 55–71, Mar. 2019, doi: 10.1007/S41027-019-00162-Z/FIGURES/5.
- [15]. I. Jacobs, J. Jaffe, and P. Le Hégarret, "How the open web platform is transforming industry," *IEEE Internet Comput*, vol. 16, no. 6, pp. 82–86, 2012, doi: 10.1109/MIC.2012.134.
- [16]. V. H. Satria and D. Herumurti, "Studi Komparatif Penggunaan Mouse, Touchpad, Touchscreen Dalam Permainan PC Petualangan Dua Dimensi," *Jurnal Sains dan Informatika*, vol. 7, no. 2, pp. 174–181, Dec. 2021, doi: 10.34128/JSI.V7I2.311.
- [17]. A. M. Wichansky, "Usability testing in 2000 and beyond," *Ergonomics*, vol. 43, no. 7, pp. 998–1006, Jul. 2000, doi: 10.1080/001401300409170.
- [18]. D. K. Deni and F. Y. Ferida, "Usability Testing Penggunaan Menu Kartu Hasil Studi Di Website Sistem Informasi Akademik Universitas Teknologi Yogyakarta," *Jurnal Teknologi dan Manajemen Industri Terapan*, vol. 2, no. 1, pp. 41–52, Apr. 2023, doi: 10.55826/TMIT.V2I1.57.
- [19]. J. Brooke, "SUS: A 'Quick and Dirty' Usability Scale," *Usability Evaluation In Industry*, pp. 207–212, Jun. 1996, doi: 10.1201/9781498710411-35.

- [20]. G. W. Sasmito, L. O. M. Zulfqar, and M. Nishom, "Usability Testing based on System Usability Scale and Net Promoter Score," 2019 2nd International Seminar on Research of Information Technology and Intelligent Systems, ISRITI 2019, pp. 540–545, Dec. 2019, doi: 10.1109/ISRITI48646.2019.9034666.

### Author Profile



**Ahmad Baihaqy**, a native of Surabaya, is a dedicated professional currently forging his career as a Lecturer at Sekolah Tinggi Ilmu Ekonomi Indonesia Surabaya (STIESIA). His academic journey commenced at Universitas Brawijaya Malang, where he earned his bachelor's degree in computer science with a major in Information Systems in 2018.

Ahmad's expertise in Business Process Management research not only enhanced his technological prowess but also enriched his understanding of the intricate dynamics of the business world. Motivated by a profound interest in management, he pursued advanced studies at Universitas Muhammadiyah Malang, culminating in the completion of his master's in management in 2020, with a specialization in human resource management research.



**Vinza Hedi Satria** earned his master's degree in informatics from the Institut Teknologi Sepuluh Nopember (ITS), where the field of Informatics has become a significant part of his life. With a passion for the world of gaming since childhood, Vinza has transitioned his hobby into a more serious pursuit. Beyond merely creating games, he actively engages in research on both the intrinsic and extrinsic elements of games.

Vinza's research focuses on exploring the educational aspects of games and delving into the algorithms related to game development. He is particularly interested in understanding whether games provide educational benefits to players. The intricacies of game development algorithms have become prominent topics that he regularly explores and works

on.