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Development of Research Ethics Review Service Information System as an Effort to Optimize Public Services

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ABSTRACT:
Technology that is developing at a rapid pace has had a significant impact on various aspects of life, including in the field of research. These technological advances can be used to develop an online and digital-based research ethics service information system to facilitate access, reduce time and increase user satisfaction. This research aims to create an integrated information system for research ethics services at the university level. This research uses Research and Development (R&D) design with eight research steps. This research produces a logical flow of 4 main processes: exempted, expedited, full board and expedited to full board. The resulting process flow starts from the entry protocol process, initial assessment, reviewer scheduling process, and assessment or review process by the reviewer team. It can include a lay person, uploading revised documents, validation process, rejection/issuance of certificates/ethical suitability certificates, and reporting. The online-based research ethics service system offers high efficiency and flexibility that allows for quick and easy access from anywhere and at any time, as well as reducing operational costs and supporting sustainability. However, the success of this online service system depends heavily on the availability of existing infrastructure, the clarity of the logical flow offered, an attractive appearance, content, and language that is easy for users to understand, adequate system security and technological literacy of its users. The research benefits of this study include providing guidance to universities in developing a research ethics review service system to ensure good governance. It also provides information to users regarding procedures for research ethics review services.

Keywords: development, services, information systems, research ethics

INTRODUCTION

Information systems are one of the multidisciplinary fields that focus on optimizing and effectively applying technology to produce useful results in various circles (Ramadan, 2021). Measuring the effectiveness of an information system can be carried out through a study. Research is a means to develop science and technology that aims to prosper humanity. Therefore, any research implementation that includes human and animal experiments needs to carry out an ethical assessment stage to protect the respondents' dignity. This is often referred to as an ethics review or ethical clearance (Susilawati et al., 2024). Researchers must have good ethics, such as being polite and keeping respondent information private. Applying good ethics and morals in research can prevent negative and detrimental impacts for respondents (Cahyanto et al., 2022).

Ethics research has a main principle, which is to ensure that the researchers respect and comply with various rational values that society can accept regarding the treatment that is allowed and not allowed in a research activity (Lestari et al., 2021). The ethical principles in a study consist of four important interrelated points. The points include respect for persons, beneficence, no maleficence and justice. The first point means the principle of respecting human

dignity (respect for persons), which requires researchers to recognize respondents' autonomy and provide special protections for respondents with limitations in decision-making. The second point is the principle of doing good (beneficence), which demands that research benefit respondents and the community and reduce potential hazards or risks. The third principle means the principle of no harm (non-maleficence), which requires researchers to avoid various actions that can harm respondents. The last point is the principle of justice (justice), which emphasizes the importance of equitable distribution of research benefits and burdens without discrimination against specific groups (Gustari & Riswanto, 2024).

Ethical problems in the implementation of research can include various forms of violations and non-conformities. This can damage scientific integrity and cause a lack of public trust in research results. The problem can be in the form of data that is made or the results of the attached research that have never been carried out (manufacturing). Data or research methods that are manipulated and deliberately change the research results according to the researcher's wishes (falsification). The researcher can also take the work or idea of another person without properly acknowledging the work or idea (plagiarism). In addition, there are also exploits of respondents, such as the absence of justice when sharing academic roles or credits and duplicating or repeating the publication of the same research results in various places without proper permission or notification to the owner. These ethical problems of research are contrary to the basic principles of scientific integrity and responsibility (Handayani, 2018).

Whether or not research is ethical can be seen based on ethical clearance or ethical code. Ethical clearance or the code of ethics is managed by an institution’s Ethics Committee or Institutional Review Board (IRB). In Indonesia, the institution that takes care of the manufacture of ethical clearance is the Research Ethics Committee (KEP). KEP has the task of assessing the feasibility of a research project, so that the rights, security and safety of respondents can be guaranteed. In health research, at the national level, Indonesia has a National Health Research and Development Ethics Committee (KEPPKN), which supports the Minister of Health in coaching, supervising and enforcing ethical principles in research and development activities in the health sector (Kemenkes, 2021).

Research can only be carried out when the code of ethics has been approved by the Research Ethics Committee (Susilawati et al., 2021). The researcher first submits the research protocol and supporting documents to the Research Ethics Committee. After that, the process of reviewing the proposed research protocol continued. Creating a code of ethics manually often takes a long time, which can ultimately hinder the implementation of research and cause dissatisfaction from users of ethical services (Putra et al., 2025). Therefore, a more efficient and transparent system is needed to support the process. The existence of services that can be done digitally can facilitate access, faster time and increase the satisfaction of ethical service users (Amin et al., 2021).

Technology that is developing very quickly has significantly impacted various aspects of life, including in the field of research. This technological advancement can be used to develop a digital-based research ethics information system that can provide online services without face-to-

face interaction. This service allows submission, evaluation, and ethical approval to be carried out more efficiently and flexibly. The service can be accessed anytime and anywhere using devices such as smartphones, laptops, or computers through internet access. The service can be adjusted to the needs, such as an official website or email, live chat rooms, or more interactive social media platforms (Sari & Marjo, 2022).

The Institute for Research and Community Service (LPPM) of Universitas Negeri Semarang is one of the institutions responsible for planning, managing and supervising during the implementation of research activities and community service. LPPM also plays an important role in ensuring that all research stages are carried out according to applicable operational standards and research ethics principles. In addition, LPPM also plays a role in the service and issuance of ethical worthiness certificates, which are often referred to as ethical clearance. The letter is a guideline that research has gone through ethical testing, so that it can be said to be feasible and in accordance with the ethical principles of research. However, in reality, there are still problems related to this. The problem experienced today is that Universitas Negeri Semarang does not have an integrated and centralized ethics review service information system at the university level. This has the potential to hamper the process of ethics assessment services because the system currently used is not built independently by the university and sometimes still receives manual services. Therefore, developing a digital information system for research ethics services at the university level is necessary.

This research is multi-year research. The three-year research roadmap includes 2024 (analyzing the need for the development of a centralized ethical service system at the university level), 2025 (developing a research ethics service information system at the university level), and 2026 (developing an ethical service promotion system). This research aims to create an integrated information system for research ethics services at the university level, so that in the future it is hoped that university research ethics services will be able to work operationally by 2026. The research benefit of this research is as a guide for universities in building a research ethics review service system so that it can be implemented with good governance, in addition to providing information to users regarding procedures in research ethics review services.

METHOD

This research uses a design Research and Development (R&D). R&D design is a research design that aims to design, develop and test the effectiveness of a product or system (Halimatussa'diah et al., 2024). The system or product created in this study is developing a research ethics service system at the university level. This research was conducted at Universitas Negeri Semarang (UNNES), Indonesia. This research is included in multi-year research, and in 2025, research will be carried out to develop a university-level research ethics service information system to optimally support research ethics review services. Sampling techniques are determined by using purposive sampling, so that a sample was obtained consisting of a team of experts from the Center for Journal and Publication Development, members of the Ethics Committee team, ethics experts and the IT team. Data was obtained through interviews, FGDs,

workshops and benchmarking on the ethics services of other universities. The stages of implementing this research consist of 8 stages as follows.

1. Identify existing resources and the initial condition of the infrastructure.
2. Model development planning.
3. Develop an initial model with a team of experts through interviews, FGDs, workshops and benchmarking on other university ethics services.
4. Systematically develop service flows and forms.
5. Digitization of research ethics review procedures and service forms.
6. Build an information system for research ethics services.
7. Conduct a trial of the service system.
8. Improving the information system for research ethics services based on the results of trial evaluation.

RESULTS AND DISCUSSION

From all stages of the process carried out, the results of the logical flow of the research ethics service system at the university level are obtained, as presented in Figure 1.

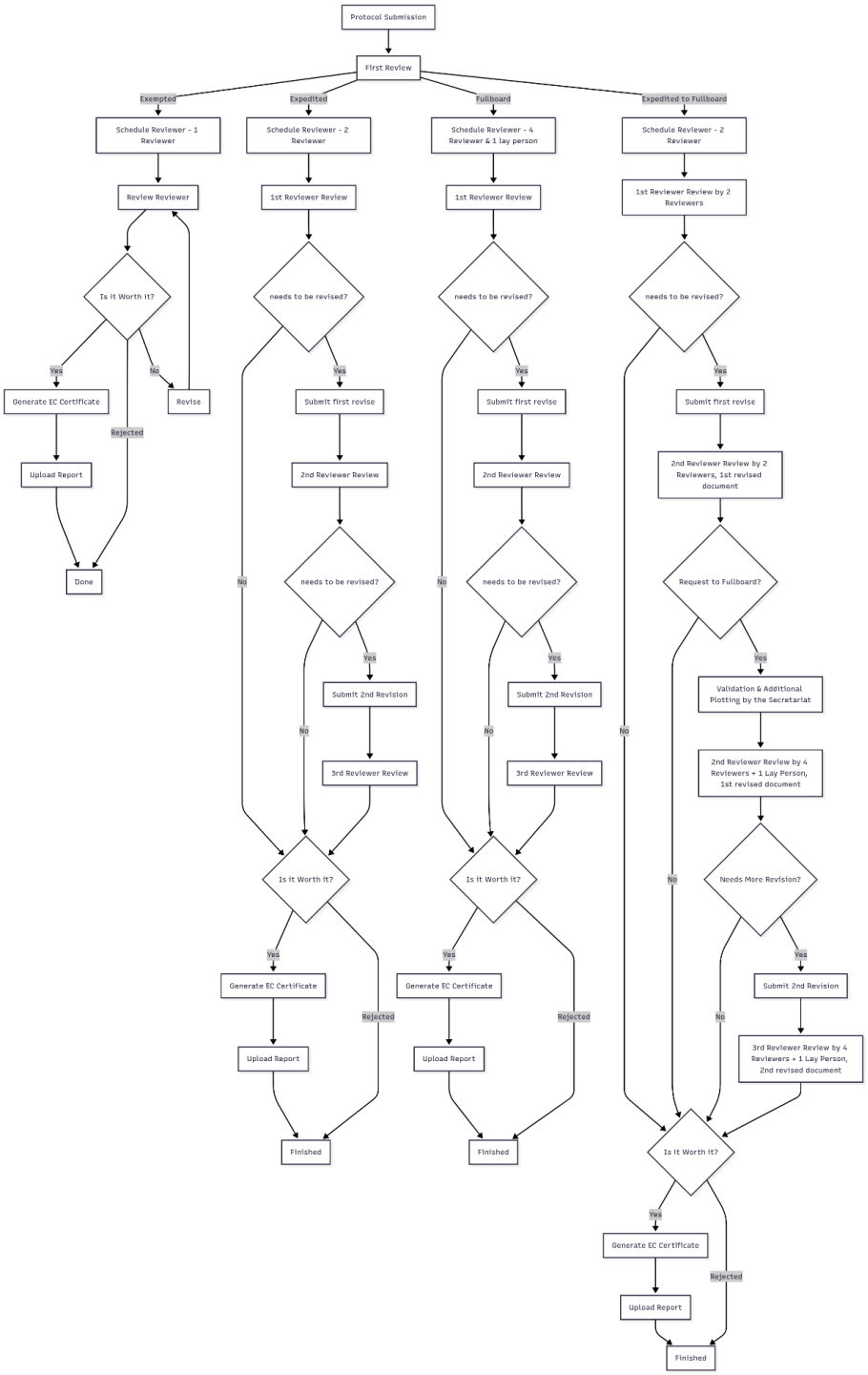

Figure 1. Logical Flow Design of Research Ethical Service System
Source: Processed research data

The results of the process flow mapping in the Figure 1 show that the ethics protocol review mechanism at the university level includes various processes consisting of exempted, expedited, fullboard, and expedited to fullboard, each of which has a review structure and different revisions. These processes show that protocol validation relies heavily on the results of

an initial review conducted by the Research Ethics Committee secretariat and a tiered assessment by reviewers, which in some cases may involve up to three stages of revision before a final decision is taken. In developing ethical service information systems, this complexity is an important foundation for building a structured and efficient system. The developed system must be able to accommodate the variety of flows and the possibility of various scenarios that may occur. One of the mitigations developed in this study is to add one category of review, namely expedited to fullboard, to facilitate proposers when there is a possibility that they may make amendments (either during the clarification process or on personal initiative) to the protocol they propose. In the flow, it can be seen that the number of reviewers assigned to review each incoming protocol document is based on the results of the initial review by the secretariat of the research ethics committee whether it is included in the categories of exempted, expedited, fullboard, and expedited to fullboard, with the number of reviewers from 1 to 5 reviewers (including one lay person) depending on the type of initial review category determined during the initial assessment by the research ethics committee secretariat team. From the flow, it can be seen that an overview of the flow starting from the entry protocol process, initial assessment, reviewer scheduling process, assessment process, or review by the reviewer team. It can include a lay person, uploading revised documents, validation process, rejection/issuance of certificates/ethical certificates and reporting. In addition, the system must also be able to automatically store revision history and reviewer decisions to reduce the potential for administrative errors and speed up the evaluation process.

By integrating manual processes into digital-based information systems, it is hoped that there will be significant efficiency in research ethics review services at universities. The digital system allows the process of submitting, reviewing, issuing certificates/certificates of ethical worthiness, and reporting to be carried out in a structured and automated manner, thereby reducing the potential for delays and administrative errors. One of the main advantages of service-based Online is easy access for users. Students, lecturers and other researchers can access the system anytime and from anywhere without having to be bound by time or location, which, of course, greatly supports the effectiveness and efficiency of research implementation. This is a practical solution, especially for users with limited mobility or time. Thus, the process of managing research ethics no longer depends on physical presence at the location but can be carried out flexibly and transparently. In addition, the use of the information system also facilitates the process of monitoring the status of the application in real time, accelerating communication between researchers and reviewers, and strengthening data documentation as an institutional archive (Haryati, 2020; Pardamean et al., 2024; Yusuf et al., 2021). Service provided online not only improves accessibility, but it can also reduce the sense of intimidation, stigma and embarrassment that clients may feel when receiving services in person. Thus, a safer and more comfortable atmosphere is created, so that clients become more open and feel freer to discuss the research plan, including the potential problems they face (Anindya et al., 2024).

The online service provided can also reduce various types of operational costs, such as administrative costs, document printing costs, as well as transportation costs that are usually

incurred by users to come directly to the research ethics service office. With a digital system, the entire process from submission, revision, issuance of certificates/certificates of ethical worthiness to reporting is done electronically, so that physical documents that require paper, ink, or manual storage are no longer required specific storage. This provides efficiency in terms of budget and supports the principle of environmental sustainability (paperless). For institutions, this cost reduction also means that resource allocation can be focused on other more strategic aspects of services, such as improving system quality, training reviewers, or increasing server capacity. Meanwhile, for service users, savings in transportation costs and waiting time provide their own benefits that encourage more active participation in the process of submitting research ethics assessments. Therefore, the digitization of research ethics services not only has an impact on the speed of the process, but also provides significant economic efficiencies for both institutions and users (Damayanti et al., 2020; Kinasih & Himma, 2024; Scott, 2020).

Although the online service provided brings many conveniences such as more flexible and efficient access, there are still several drawbacks that cannot be ignored. One of the main risks is the potential breach of the confidentiality of users' personal data. If the digital security system used is not strong enough, especially in the security aspect of the system, sensitive information stored in the database may be leaked, accessed, or misused by unauthorized third parties. This can certainly have serious impacts, ranging from identity theft to misuse of data for certain purposes. Hence, data protection is a very important aspect in developing service-based services online (Anindya et al., 2024; Rahmadhea, 2024). In addition to the risk to data security, the online service also has the potential to cause misunderstandings between service providers and users. This can happen due to the limitations of non-verbal communication, which usually helps to clarify the intent and emotion in a direct interaction. In addition, the use of technology in online services is also vulnerable to various technical obstacles, such as disconnected internet connections, interruptions in the server, and damage to the device used. These conditions can hinder the smooth running of the service and affect the quality of communication and user satisfaction (Haryati, 2020; Leonardo & Jacob, 2025).

Online service dependencies against the internet connection cause users to have to pay additional costs to be able to access it, such as expenses for data packages (internet quota) or Wi-Fi networks (Fitriasari et al., 2020). In addition to the financial aspect, the continuous use of online-based services can also have a negative impact on physical and mental health. Physical activity tends to decrease due to the amount of time spent in front of the screen, which in the long run can affect the body's fitness. In addition, the digital world also opens opportunities for negative behaviours such as cyberbullying, as well as increasing the risk of gadget addiction. This condition can lead to psychological disorders such as anxiety, stress and even depression, especially if there is no healthy and balanced time of use (Ursula, 2021).

Online service is also highly dependent on the user's level of understanding and knowledge of technology. If the user has limitations in operating digital devices or is unfamiliar with the system used, then the service process may be hampered. This can cause confusion, errors in filling in data, and inconsistencies in understanding the established procedures. Therefore, the

success of the online service provided is determined not only by the sophistication of technology, but also by the ability of users to access and utilize it optimally (Kinasih & Himma, 2024; Mardy Handika & Marjo, 2020).

CONCLUSION

The mechanism for reviewing ethical protocols at the university level produced in this study includes four main processes, namely: exempted, expedited, fullboard, and expedited to fullboard. The resulting process flow starts from the entry protocol process, initial assessment, reviewer scheduling process, and assessment or review process by the reviewer team. It can include a lay person, uploading revised documents, validation process, rejection/issuance of certificates/ethical suitability certificates and reporting. The online-based research ethics service system offers high efficiency and flexibility that allows for quick and easy access from anywhere and at any time, as well as reducing operational costs and supporting sustainability. However, the success of this online service system is highly dependent on the availability of existing infrastructure, the clarity of the logical flow offered, an attractive appearance, content and language that is easy to understand by both the secretariat team and the review team (the research ethics committee team including lay persons), adequate system security and the technological literacy of its users. The suggestion given for further research is to develop an appropriate monitoring system model for each category of the review process, especially those containing the potential for SAE or Serious Adverse Events, which can be implemented at the university level.

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