

Implementation of the Hybrid History Information System On This Day as a Medium for Improving Digital Literacy

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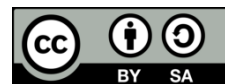
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ABSTRACT

The development of digital technology demands increased digital literacy so that people can access, evaluate, and utilize information critically, including in understanding historical content. History, as a field of knowledge widely spread in the digital space, is vulnerable to simplification and misinformation if not presented through appropriate educational media. This study aims to implement the hybrid historical information system On This Day as a medium for increasing digital literacy. The research methods used include system design, application implementation, and system evaluation for users. The developed information system presents historical events based on the date of occurrence using a hybrid approach that integrates digital content, interactive presentation, and flexible access. The results show that the hybrid historical information system On This Day is able to increase user engagement and support understanding of historical context and digital literacy skills, particularly in the aspects of information evaluation and understanding the chronology of events. Thus, this system has the potential to be an alternative history learning medium that is relevant and adaptive to the needs of society in the digital era.

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1. INTRODUCTION

The rapid development of Information and Communication Technologies (ICT) has significantly transformed the way information is produced, accessed, and managed in modern society. The historical evolution of ICT demonstrates its crucial role in improving efficiency, transparency, and information dissemination across various sectors [1]. In this digital transformation era, digital literacy has become a fundamental competency required to effectively utilize digital technologies. Digital literacy is not limited to technical skills but also includes the ability to critically interpret information, evaluate digital sources, and apply digital tools responsibly [4], [6]. Recent studies emphasize that digital literacy significantly influences the effective use of digital technologies and overall performance in academic and professional environments [7].

In educational contexts, particularly in history learning, the integration of digital technology provides opportunities to enhance accessibility, interaction, and contextual understanding. The implementation of intelligent systems such as history-based question-answering systems utilizing knowledge graphs demonstrates how digital technology can support structured historical information retrieval and learning processes [3]. Moreover, educational technology development in the post-epidemic era has highlighted both opportunities and challenges in delivering flexible and technology-enhanced learning environments [13]. The integration of interdisciplinary and modular educational technologies further supports innovative learning approaches that

combine traditional and digital methods [14], [15]. The concept of hybrid systems, which integrate printed content with web-based technologies, offers a promising approach to bridging conventional learning materials with interactive digital platforms. Augmentation of printed content using web-based systems enables users to access extended information, multimedia content, and contextual explanations through digital interfaces [9]. Similarly, cross-platform mobile and web-based application architectures demonstrate how integrated systems can provide flexible access to information anytime and anywhere [11]. However, as web-based systems become more widespread, ensuring application security becomes essential, particularly in protecting user data and maintaining system integrity [12].

The “On This Day” concept presents historical events based on specific calendar dates, offering temporal relevance and contextual linkage between past and present events. Time-based data management and information processing approaches demonstrate how historical information can be structured and analyzed through digital systems [2]. By implementing a hybrid historical information system based on the On This Day concept, historical content can be delivered in a more contextual, interactive, and digitally accessible manner. Such an approach not only enhances user engagement but also supports the development of digital literacy by encouraging critical exploration and responsible use of historical information.

Based on this background, this study aims to implement a Hybrid History Information System based on the On This Day concept as a medium for improving digital literacy. The research focuses on system design, web-based implementation, content augmentation strategies, and evaluation of the system’s contribution to users’ digital literacy skills. It is expected that this study will contribute to the development of technology-enhanced educational systems and provide an innovative approach to history learning in the digital era.

2. METHOD

This study employs a Research and Development (R&D) approach aimed at producing and evaluating a product in the form of a hybrid historical information system based on the On This Day concept. The R&D approach was selected because the study does not focus solely on analyzing phenomena, but also emphasizes the processes of system design, implementation, and evaluation as a medium for enhancing users’ digital literacy [1]. This approach is appropriate for research in the field of educational information systems, as it enables direct testing of the effectiveness of the developed product within a real-world usage context [9].

The system development model applied in this study is the ADDIE model, which consists of five main stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen due to its systematic and flexible nature, and its widespread use in the development of digital technology-based learning media [6].

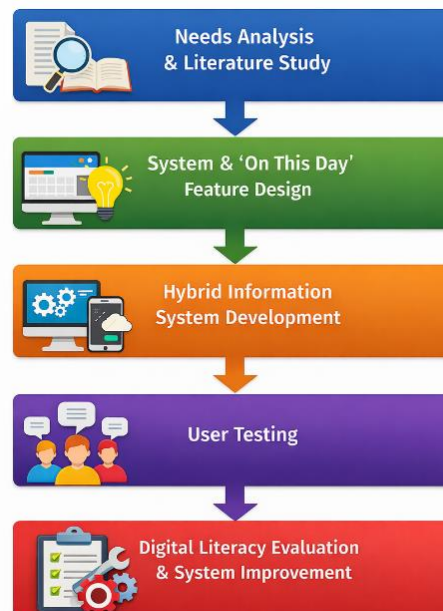


Figure 1. Flowchart of the Hybrid History Information System Development Method On This Day

The development stages are described as follows:

1. **Analysis**
The analysis stage was conducted to identify user needs and issues related to digital literacy and history learning. The analysis included a literature review related to digital literacy and digital history [1–5], user needs analysis, and identification of relevant historical content for implementation in the On This Day system.
2. **Design**
The design stage included the design of the system architecture, application workflow, user interface design, and the design of the system's main features. Designed features included the presentation of daily historical events, integration of historical sources, multimodal content, and interactive elements that support users' digital literacy skills [7].
3. **Development**
At this stage, the development of the On This Day hybrid historical information system was carried out in accordance with the predetermined design. System development involved the implementation of a historical database, content presentation modules, and digital literacy support features such as source search and chronological navigation. The system was developed to be accessible online and offline, as a form of implementing the hybrid concept [9].
4. **Implementation**
The implementation stage was carried out by testing the system with target users, namely students or learners who have access to digital history learning. At this stage, users are given the opportunity to use the system for a specified period of time to gain first-hand experience in accessing and understanding historical content based on "On This Day."
5. **Evaluation**
The evaluation stage aims to assess the system's effectiveness in improving users' digital literacy. Evaluation is conducted by measuring aspects of historical content understanding, the ability to evaluate information sources, and user responses to system features. The evaluation results are used as a basis for improving and refining the information system being developed [10].

3. RESULTS AND DISCUSSION

3.1. System Design

Use case diagrams are used to illustrate the interactions between actors and systems in the development of the Hybrid Historical Information System On This Day. These diagrams serve to clarify the system's functional requirements and the roles of each actor in carrying out the available processes. Use case diagrams enable a systematic understanding of the interaction flow between users and administrators with the system before the implementation phase.

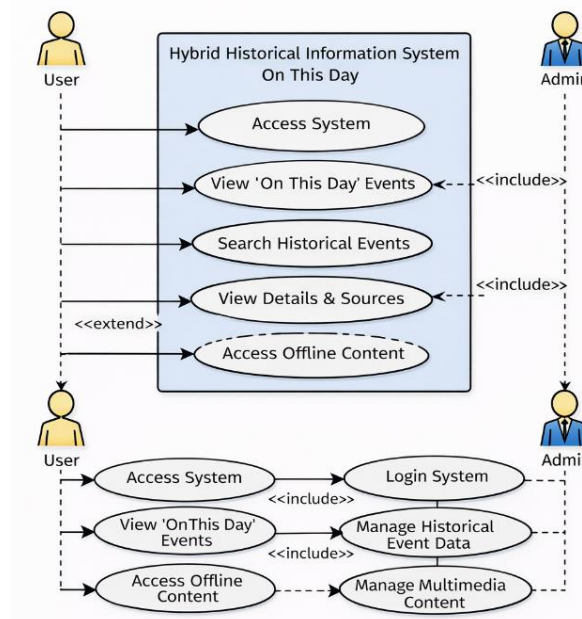


Figure 2. Use Case Diagram

3.2. System Implementation Results

The research results show that the hybrid historical information system On This Day was successfully implemented according to the planned development stages. The system provides key features in the form of presenting historical events by date, multimodal historical content (text and visual), and integration of information sources that can be searched by users. In addition, the system can be accessed online and offline, thus supporting the hybrid concept in presenting historical information. The implementation of the Hybrid Data Application successfully combined data seamlessly. For example, on January 22, the application displayed global events from Wikipedia alongside local Pekanbaru news, such as "Drainage repairs on Jalan HR Soebrantas" or "Pekanbaru BMKG Weather Info". This addresses the need for socio-geographically relevant content.

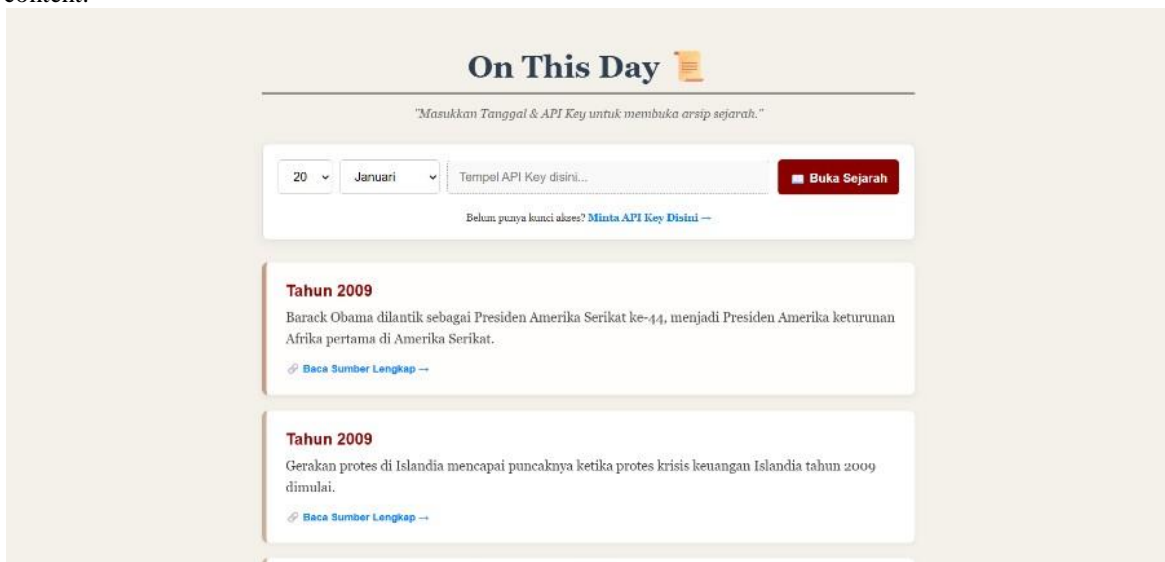


Figure 3. The "On This Day" Web Interface displays a list of events.

3.2.1. Security Mechanism

Security and User Management Mechanisms: The implementation of the Freemium feature is proceeding as planned. Testing shows the system is able to detect user IP addresses. When access exceeds five times, the system automatically blocks access and displays a notification requesting an API key. The "Request API Key" feature, integrated directly with WhatsApp Admin, facilitates interaction between administrators and users, creating a community of registered users.

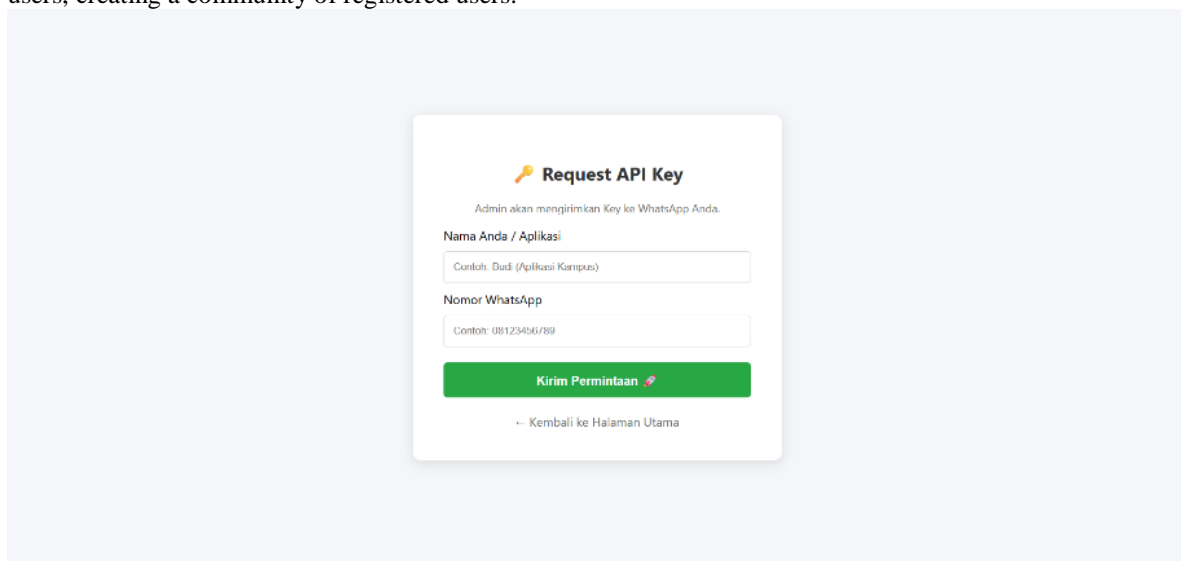


Figure 4. API Key request form integrated with WhatsApp

3.2.2. Accessibility of Information Sources

One of the system's key advantages is the Direct Source Link feature. In the mobile version, when users select an event, the app doesn't redirect them to an external browser, but instead opens the source article within the app (in-app browser). This enhances user experience and ensures users are reading information from valid sources (such as Google News search results or Wikipedia articles). Based on observations of system usage, users are able to easily access and navigate daily historical content. The chronology feature and grouping events by theme help users understand the historical context in a more structured way. This demonstrates that the system functions not only as a medium for presenting information but also as a tool to support digital history learning.

3.3. User Digital Literacy Evaluation Results

Evaluation of users' digital literacy was conducted through questionnaires and observations of system usage. The analysis revealed improvements in several aspects of digital literacy after users utilized the On This Day hybrid historical information system. This improvement was particularly evident in users' ability to understand the context of historical events, evaluate information sources, and relate past events to current conditions.

Users demonstrated a tendency to not only read historical content but also explore supporting sources provided within the system. This indicates that the system is capable of encouraging critical and reflective digital literacy behavior, in line with the concept of digital literacy, which emphasizes evaluative skills, rather than simply consuming information [1][4].

3.3.1. Hybrid Discussion of the Implementation of a Hybrid Historical Information System

The implementation of the On This Day hybrid historical information system demonstrates that the hybrid approach is effective in bridging formal and informal learning. Flexible access to historical content allows users to utilize the system in both structured learning contexts and independent use. This finding aligns with previous research suggesting that hybrid-based learning systems can increase user engagement and the effectiveness of digital learning [9]. Furthermore, the presentation of historical events on a daily basis provides a contextual and relevant learning experience. This approach helps users understand history as a series of interconnected events, rather than as isolated pieces of information. This supports the development of users' historical understanding and chronological thinking [7].

3.3.2. Discussion of the Role of Systems in Digital Literacy

From a digital literacy perspective, the On This Day system not only serves as an information medium but also as a learning tool that encourages critical thinking skills. The provision of verifiable historical sources helps users distinguish between valid and invalid information, thereby contributing to reducing the risk of historical misinformation in the digital space [5]. The results of this study support previous findings that state that the use of digital-based educational information systems can improve users' digital literacy if designed with the right pedagogical approach [6][10]. Thus, the hybrid historical information system On This Day has the potential to be an alternative medium for learning history that is relevant to the needs of today's digital society.

4. CONCLUSION

This research successfully implemented the hybrid historical information system On This Day as a supporting medium for improving digital literacy. The developed system is able to present historical information contextually through daily events, supported by multimodal content and integration of information sources that can be searched by users. The implementation of the hybrid concept allows the system to be accessed flexibly, both online and offline, thus supporting the needs of history learning in the digital era. The evaluation results show that the use of the hybrid historical information system On This Day makes a positive contribution to improving users' digital literacy, particularly in aspects of understanding historical context, the ability to evaluate information sources, and critical thinking skills regarding digital historical content. Users not only act as consumers of information, but are also encouraged to explore and reflect on the historical events presented. Thus, the hybrid historical information system On This Day has the potential to be an alternative medium for history learning that is relevant and adaptive to the development of digital technology. This research emphasizes that the development of educational information systems needs to pay attention to the integration between aspects of technology, content, and digital literacy to provide a more meaningful learning impact.

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