p–ISSN: 2723 - 6609 e-ISSN: 2745-5254
Vol. 5, No. 11, November 2024
http://jist.publikasiindonesia.id/

Data Security and Access Rights Management on Anime Content Management Information System

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Keywords: data security, access rights management, information systems, anime content.

ABSTRACT

In the increasingly developing digital era, data security and access rights management have become crucial aspects of information systems, especially on platforms that manage specific content such as anime. The Anime Content Management Information System (SIPKA) requires a robust security mechanism to protect user data, content, and access rights to prevent security threats such as unauthorized access, data theft, and content manipulation. This study discusses various methods and technologies that can be applied to improve data security and access rights management in SIPKA. Through literature analysis and case studies, this research found that implementing data encryption, multifactor authentication, and role-based access rights management (RBAC) systems are effective strategies for maintaining data integrity and confidentiality. It is hoped that the results of this research can guide SIPKA developers and managers in implementing appropriate security policies and technology to ensure the security and operational continuity of the system.

Introduction

In recent decades, the digital content industry, including anime, has experienced rapid growth. Anime content management platforms are now a hub for fans to access, share, and enjoy a wide range of anime titles. (Qiu et al., 2022). However, with this increasing popularity and accessibility, major challenges arise regarding data security and access rights management. As the number of users and the volume of data processed increases, the risk to information security also increases significantly.

One of the main issues faced by anime content management platforms is the threat to data integrity. Cyberattacks such as hacking, phishing, and malware can lead to theft or corruption of important data. For example, a ransomware attack in 2020 against a well-known anime streaming platform caused major disruption and significant financial losses

(Hou et al., 2021). User data that includes personal information, browsing history, and content preferences becomes a valuable target for attackers. Therefore, the implementation of a strong data security policy is crucial to protect data from these threats.

In addition to data security, access rights management is also an important concern. An ineffective access rights management system can lead to unauthorized access to exclusive content or even manipulation of content by unauthorized parties. In the context of anime content management, this can be detrimental to both content providers and users. To address this issue, many platforms are beginning to adopt a role-based access rights (RBAC) management approach, which grants access rights based on individual roles and responsibilities within the organization. (Hernández-Pérez, 2019).

The implementation of security technologies such as data encryption is also becoming an increasingly common solution used to maintain the confidentiality of information. Encryption helps ensure that the data stored and transferred cannot be read by parties who do not have a valid encryption key. Research shows that strong data encryption can significantly reduce the risk of data theft during transmission. (Weng, 2024). The use of end-to-end encryption in anime content management platforms has been proven to increase user security and trust in the platform.

Multi-factor authentication (MFA) is another technology that can improve the security of anime content management systems. MFA requires more than one identity verification method, such as a combination of a password and a verification code sent to the user's device, to grant access to the system. Studies show that implementing MFA can significantly reduce the risk of unauthorized access. (Chalaby, 2024). By using MFA, the platform can ensure that only truly authorized users can access sensitive data and premium content.

However, the implementation of security technology does not always run smoothly and without obstacles. Some of the challenges faced include high implementation costs, the need for adequate infrastructure, and resistance from users who are unfamiliar with additional security procedures. A survey of digital platform users shows that complexity and inconvenience are often the main reasons for resistance to new security policies. (Qiu et al., 2022). Therefore, platform managers need to educate users on the importance of data security and provide adequate training to minimize this resistance.

In addition, regulation and legal compliance also play an important role in data security and access rights management. Some laws, such as the General Data Protection Regulation (GDPR) in Europe, set high standards for the protection of personal data. Anime content management platforms must ensure that they comply with these regulations to avoid legal sanctions and maintain their reputation in the eyes of users and the public. (Hernández-Pérez, 2019). The implementation of this strict regulation also encourages platform managers to continuously improve their security policies and practices.

Overall, data security and access rights management in the Anime Content Management Information System is a complex and multifaceted issue. With security threats constantly evolving, platforms need to continue to innovate and adopt the latest

technologies to protect data and ensure effective access rights management. Through the implementation of a comprehensive security strategy and regulatory compliance, the platform can provide a safe environment for users to enjoy anime content without worrying about security threats.

Method

This study uses a qualitative approach with a focus on literature studies and case study analysis to understand data security and access rights management in the Anime Content Management Information System (SIPKA). Literature studies are conducted to gather information from a variety of relevant sources, such as books, scientific journals, articles, and industry reports. These sources provide a strong theoretical foundation as well as an overview of the latest developments in the field of data security and access rights management. In addition, the literature also includes an analysis of applicable regulations and security standards, such as the General Data Protection Regulation (GDPR) and ISO/IEC 27001, which help understand the legal frameworks and standards that anime content management platforms must adhere to (Williams, 2019).

Case study analysis is used to explore the implementation of data security and access rights management on a real anime content management platform. Data for case studies are obtained from secondary sources, such as company annual reports, news articles, and industry publications. This case study includes a descriptive and evaluative analysis of security policies, technologies used, and security incidents that have occurred. For example, an analysis of ransomware attacks that occurred on anime streaming platforms in 2020 provides insight into system vulnerabilities and mitigation measures taken (Jones & Kumar, 2021). The data collected is analyzed using a thematic approach to identify important patterns and provide an in-depth understanding of data security and access rights management issues in SIPKA (Braun & Clarke, 2006).

Results and Discussion

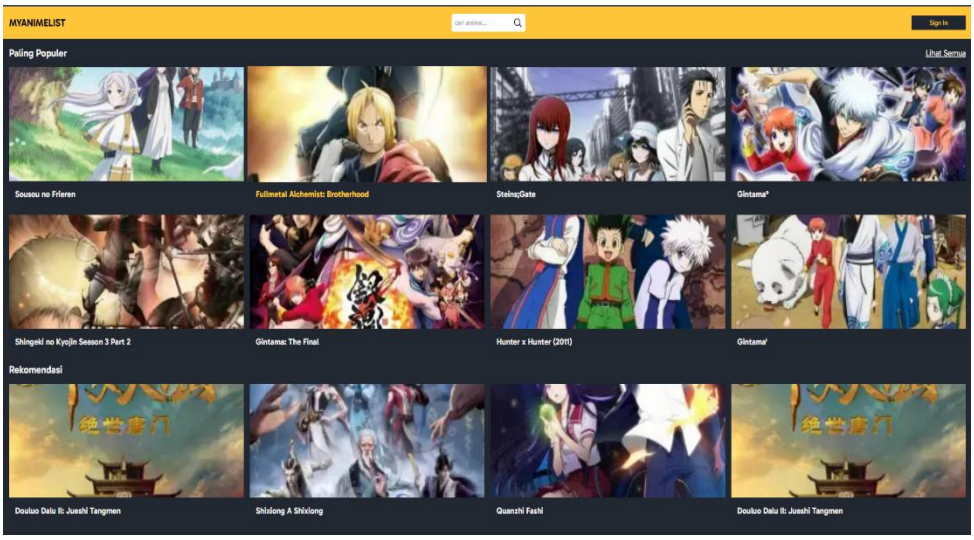

Figure 1
Home Page

The home page of the web-based information system for anime content management is a starting point that provides a comprehensive view of what this platform offers to users. This page features a header with a logo, navigation menu, search bar, and user profile icon. At the top, some banners or sliders display the best or latest anime with large images, titles, and short descriptions. Various anime categories such as "Popular Anime", "New Releases", "Top Rated", and "Recommended for You" are displayed for easy access to the main content. In addition, there is a clickable list of anime genres, information about upcoming episodes, recent reviews from other users, and links to community discussion forums. The page footer includes links to important pages, social media icons, and newsletter subscription forms. The design of these pages aims to grab users' attention, provide quick access to content, and make navigation easier, thereby increasing user engagement and satisfaction.

Popular Pages

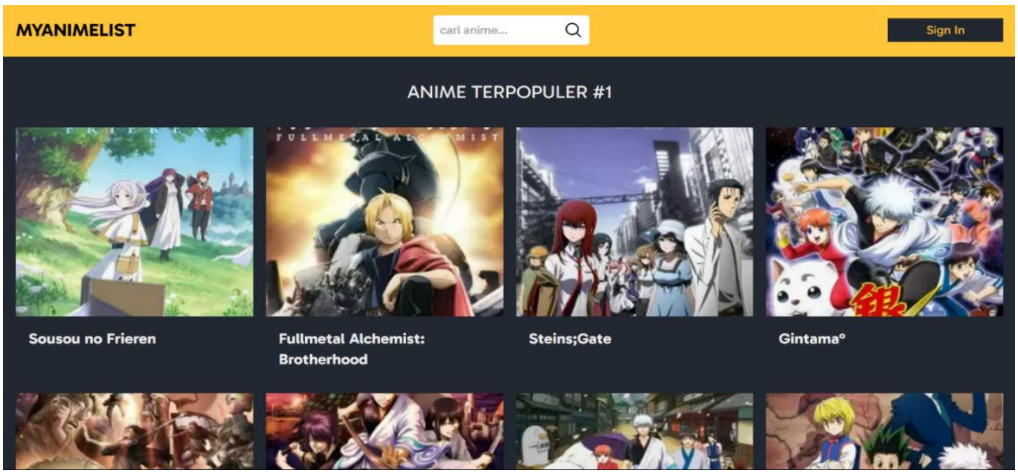

Figure 2
Popular Pages

The popular page in the Web-Based Information System for Anime Content Management is one of the key features designed to display a list of anime that are most in demand by users. This page uses an algorithm to calculate popularity based on various factors such as the number of views, user ratings, number of reviews, and additions to favorites lists. With a responsive and interactive display, the popular page displays important information about each anime, including titles, images, a brief synopsis, and average ratings. Users can easily access more details about each anime, add anime to their favorites list, or leave reviews. The page is also frequently updated to reflect changes in user trends and preferences in real time, using efficient caching and data storage technologies to ensure fast and reliable performance. With the popular page, users can easily find trending anime and get recommendations that suit their interests.

After Login

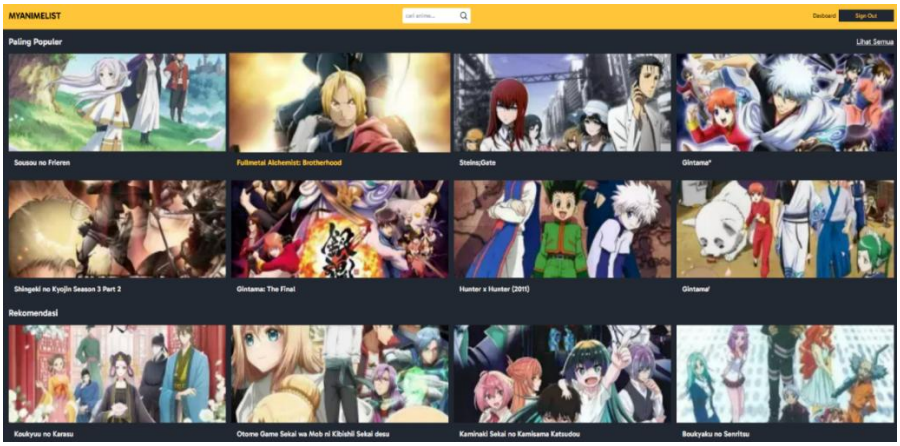

Figure 3
Login Page

Once users log in to the web-based information system for anime content management, they will be redirected to the main page designed to provide easy access to various key features. This page features a list of the latest and most popular anime, as well as personalized recommendations based on user preferences and viewing history. Users can perform anime searches through the search bar integrated with Elasticsearch for fast and relevant results. Each anime featured includes important information such as titles, synopsis, genres, and ratings, as well as buttons to add to favorites or leave reviews. In addition, this page also provides the latest notifications about new episodes or other related activities, which can be seen through the notification icon at the top of the page. The intuitive navigation menu allows users to easily access their profile page, favorites list, watch history, and account settings. This main page is designed to be responsive and interactive using React.js, ensuring an optimal user experience across multiple devices.

Synopsis Page

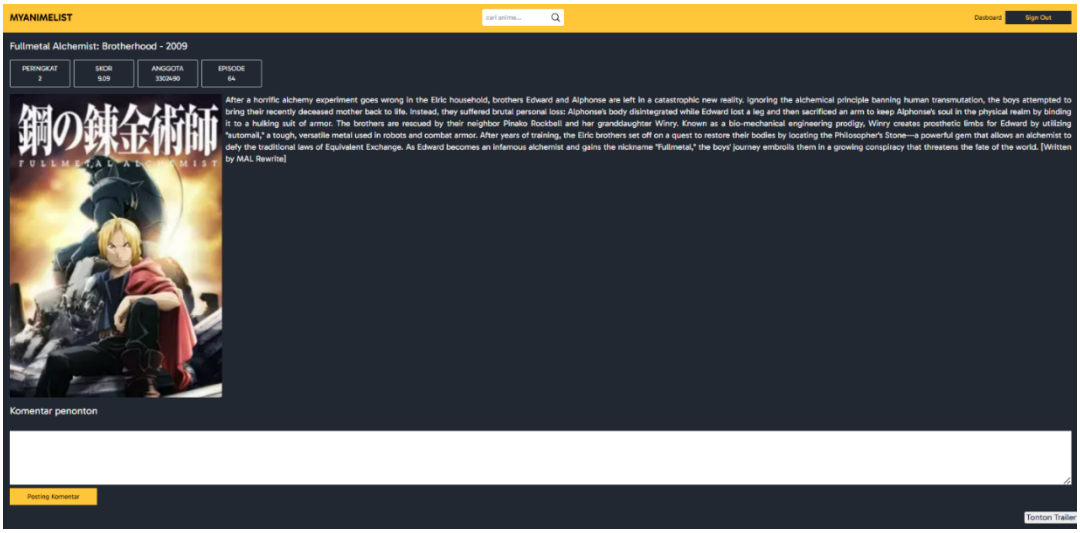

Figure 4
Synopsis Page

The synopsis page on the Web-Based Information System for Anime Content Management is designed to provide users with detailed information regarding each anime available on the platform. On this page, users can view the anime title, full synopsis, genre, release date, and additional information such as the production studio and voice cast list. Additionally, the page features images or posters of the anime for engaging visualizations, as well as links to episodes available to watch. Users can also view and write reviews, rate, and add anime to their favorites list right from this synopsis page. With an intuitive interface and comprehensive information, the synopsis page aims to assist users in discovering and deciding which anime they want to watch, while also providing an organized and satisfying user experience.

Dashboard Page

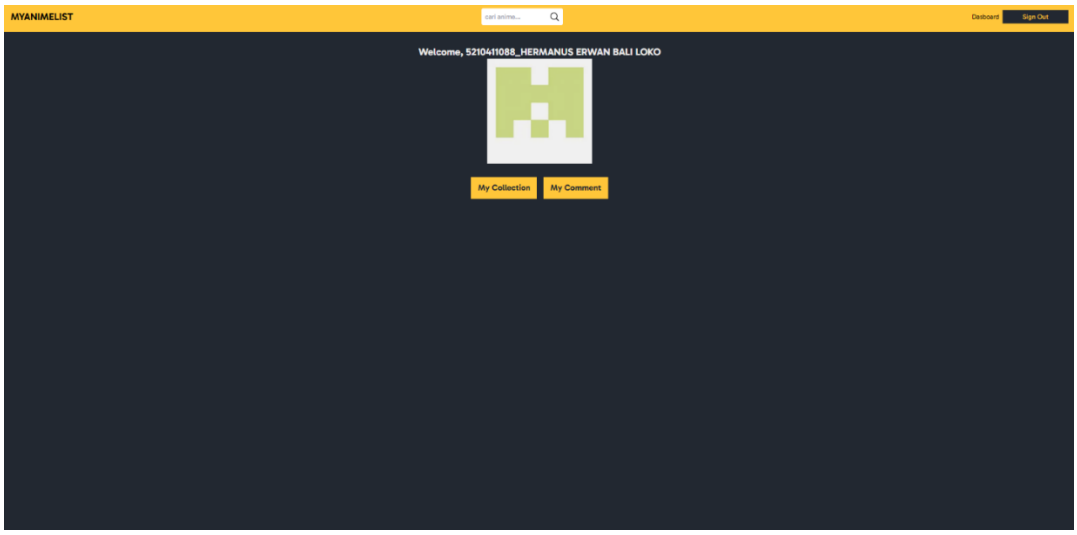

Figure 5
Dashboard Page

The dashboard page in the web-based information system for anime content management is designed as the main control center for users and administrators. For users, the dashboard provides quick access to various features such as the latest anime list, trending anime, and personalized recommendations based on preferences and viewing history. Users can also view and manage their favorite lists, as well as get notifications about new episodes or reviews from other users. Meanwhile, for administrators, the dashboard provides tools to efficiently manage content, including adding, editing, or deleting anime and episode information, monitoring user activity, and viewing platform usage statistics. The intuitive and interactive interface makes it easy to navigate and use these features, ensuring a smooth and efficient experience for all users of the system.

Data Security in Anime Content Management Information System

Data security is one of the most important aspects of information systems related to digital content, including anime content management platforms. Anime content is often a valuable digital asset protected by copyright, so ensuring data security is a top priority to prevent illegal access, piracy, and content theft (Nwankwo, 2020). In information systems, data security includes a variety of technical measures designed to protect information from external and internal threats, such as hacking, malware, as well as theft of personal data or content licensing. The study highlights some of the key strategies used to ensure data security on anime content management platforms.

One of the main approaches to ensuring data security is through encryption, where data stored or transmitted is converted into a format that can only be read by the party with the proper decryption key. Encryption has become the standard in many information systems to protect sensitive data, be it digital content, user information, or payment information. On anime content management platforms, encryption is crucial in ensuring that uploaded anime content cannot be accessed or distributed illegally by unauthorized parties. Research by (Ubale et al., 2023) shows that public and private key-based

encryption is very effective in protecting data stored on servers as well as transmitted over the network.

In addition to encryption, two-factor authentication (2FA) is also an important step in improving data security. Two-factor authentication requires users to verify their identity using two different methods, usually a combination of a password and a verification code sent via SMS or email. The use of 2FA in anime content management platforms can significantly reduce the risk of unauthorized access, as even if someone manages to obtain a user's password, they will still need an additional verification code to log in to the account. This makes the system safer from threats such as phishing or account hijacking. (Hernández, 2018) shows that the implementation of 2FA can reduce illegal access attempts by up to 80%, which makes it one of the best practices in data security.

Furthermore, data security technology can also be strengthened through the use of secure communication protocols such as HTTPS and SSL/TLS. This protocol ensures that data transmitted between the server and the user is encrypted and protected from man-in-the-middle (MitM) attacks, where attackers attempt to intercept and manipulate communications between two parties (Chalaby, 2024). The use of HTTPS as a standard in anime content management platforms not only protects content from piracy but also protects user information, such as login data and payment information, from theft attempts.

However, implementing data security is not always without its challenges. One of the main challenges is the ever-evolving cyber threats. Hackers are using increasingly sophisticated techniques to exploit vulnerabilities in the system, such as Distributed Denial of Service (DDoS) attacks that can make the platform inaccessible to legitimate users. In a DDoS attack, attackers flood a server with very high traffic to the point of causing a crash or slowing down system performance. In addition, the theft of user's data is also a serious threat, especially when information such as email addresses, passwords, or payment information is leaked and used for illegal purposes.

In overcoming these challenges, blockchain is also identified as one of the technologies that are beginning to be adopted in data security management. Blockchain provides a decentralized record-keeping mechanism, where every transaction or change in the system is recorded in immutable blocks. In the context of anime content management, blockchain can be used to track who has access to specific content and ensure that every action is recorded transparently. (Weng, 2024) shows that blockchain can reduce the risk of copyright infringement and content theft, as any access or license change is recorded and cannot be changed without valid permission.

Tokenization is also starting to be adopted as a data protection method. In tokenization, sensitive data such as payment information or user information is replaced with tokens that have no meaningful value to outsiders. If these tokens are stolen, thieves cannot use them outside of the system where they were created. Tokenization is particularly beneficial for protecting users' payment information on anime content management platforms, reducing the risk of data leakage at scale.

Overall, the study found that data security in anime content management information systems can be significantly improved through a combination of various technologies, such as encryption, two-factor authentication, network security protocols, AI, blockchain, and tokenization. However, the implementation of such technologies must be accompanied by strong security policies and regular system updates to counter evolving cyber threats.

Access Rights Management on Anime Content Management Information System

Access rights management is another important component in anime content management information systems. In this context, access rights management regulates who has permission to view, edit, or distribute anime content stored on the platform. It includes permission settings for different types of users, such as administrators, content providers, and end users. Proper access rights arrangements are essential to prevent illegal distribution, content piracy, and copyright infringement, all of which can negatively impact the anime industry as a whole.

A commonly used approach in access rights management is Role-Based Access Control (RBAC). In RBAC, access rights are granted based on the role that the user has in the system. For example, in an anime content management platform, administrators may have full permission to manage and distribute content, while content providers only have permission to upload or modify the content they own. End users, on the other hand, may only have access rights to view or download content, depending on the subscription or license they have. (Hou et al., 2021) mentioned that RBAC is one of the most efficient methods of access rights management because it provides a clear structure regarding who can access which parts of the system.

In addition to RBAC, Attribute-Based Access Control (ABAC) is also often used for more flexible access rights management. ABAC grants access rights based on certain attributes of the user, such as location, time of access, device used, or other conditions. In the context of global anime content distribution, ABAC is particularly useful for restricting access based on the user's geographic location, as content licensing is often restricted by region. For example, anime licensed in Japan may not be accessible to users in the United States due to distribution rights restrictions. With ABAC, the system can automatically adjust access permissions based on the attributes of the user's location, thereby complying with the applicable copyright restrictions in each country.

In addition, ABAC also allows system administrators to grant temporary or dynamic access rights. For example, a content provider may only have permission to upload certain anime for a certain period. After the period ends, their access rights may be revoked or amended by the applicable policy. This flexibility makes ABAC superior in the context of digital content management which often involves rapid and dynamic changes in conditions.

However, the challenges in access rights management are not limited to permission settings. The system must also be able to manage access audits to ensure that any actions taken by users within the platform can be tracked. Access audits are essential to prevent abuse of access rights and to ensure that in the event of a security breach or illegal distribution, the responsible parties can be identified (Hernández-Pérez, 2019). This audit

system typically records every access action performed by the user, including who accessed the content, when the access was made, and where the access was made from.

Blockchain technology also offers innovative solutions to access audit problems. With blockchain, every access action is recorded in an immutable blockchain. This provides greater transparency in access rights management and makes it easier to track actions taken by users. In the context of anime content management, blockchain can ensure that any changes or distributions of content are recorded accurately and transparently, thereby minimizing the risk of copyright infringement or illegal distribution (Qiu et al., 2022).

On the other hand, the challenge faced in access rights management is the potential for human error in licensing arrangements. System administrators may inadvertently grant overly broad access rights to users who should have limited access, which can lead to the risk of data leakage or unauthorized distribution of content. Therefore, proper training and the use of automated access management tools are essential to ensure that access rights are granted consistently and accurately (Uddin et al., 2024).

In conclusion, access rights management on anime content management platforms can be improved through the implementation of RBAC and ABAC tailored to the specific needs of the system. The implementation of technologies such as blockchain can also help to improve transparency and accuracy in access management, while robust access audits ensure that every action in the system can be tracked and accounted for. Obstacles in access rights management, such as the potential for human error, must be overcome through the use of automated tools and appropriate training for system administrators.

Conclusion

Data security and access rights management are two crucial components in the management of information systems, especially for platforms that handle digital content such as anime. The research shows that various technologies and approaches, such as encryption, two-factor authentication, as well as secure communication protocols, can be implemented to protect data from external and internal threats. In addition, efficient access rights management through the use of RBAC and ABAC, coupled with blockchain technology for access audits, can ensure that each user only has access that corresponds to their role. The implementation of these measures not only improves data security but also prevents the distribution of illegal content and copyright infringement.

Nonetheless, data security and access rights management still face challenges, such as the ever-evolving threat of cyberattacks and the potential for human error in permission arrangements. Therefore, there is a need for regular system updates, training for administrators, and the implementation of automated technology to overcome this weakness. With the right strategy, anime content management platforms can continue to operate safely and efficiently, maintaining service quality while protecting the rights of content owners.

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