

Ease of Practical Information Access in the Digital Transformation Era Through the Utilization of the Earthquake Website in Kaimana Regency

Erfan Wahyudi¹, Elias Hendrik Frasawi², Ahmed Shodiq Al Misry³

^{1,2}Institute of Home Affairs Governance, Indonesia

³Al Akhawayn University, Morocco

erfan.wahyudie@gmail.com¹, eliashendrikfrasawi@gmail.com², asham19711@gmail.com³

Abstract:

This study aims to investigate and analyze the extent to which ease of access to information through the Earthquake Website can enhance the quality and speed of earthquake information dissemination in Kaimana Regency. Using qualitative methods and an analytical descriptive approach, this research provides an in-depth depiction of how users utilize the website, the challenges encountered, and its impact within the context of digital transformation in the region. The findings indicate that the Earthquake Website provides real-time information about earthquake locations, magnitudes, and potential hazards. Collaboration between the government, non-governmental organizations, and the local community strengthens efforts in earthquake disaster prevention and mitigation. However, several challenges hinder the optimal use of this website, such as low digital literacy, limited internet access in remote areas, and a lack of public awareness regarding the importance of the provided information. To address these challenges, proposed solutions include digital literacy education and training programs, enhancement of digital infrastructure, and intensive and continuous awareness campaigns. This research underscores the significance of the Earthquake Website in earthquake mitigation efforts and highlights strategic measures that can be taken to overcome existing obstacles. With the implementation of appropriate solutions, it is expected that the effectiveness of the website's use can be improved, thereby optimizing earthquake prevention and mitigation efforts in Kaimana Regency.

Keywords: Earthquake Website; earthquake information; digital transformation; disaster preparedness; Kaimana Regency;

1. Introduction

Earthquakes are shock phenomena that occur on the earth's surface. Earthquakes are classified into several types based on their causes, including tectonic earthquakes, volcanic earthquakes, collapse earthquakes, and explosion earthquakes. The intensity of earthquakes varies, ranging from imperceptible to very strong and capable of causing severe damage. Earthquakes are measured using seismometers, and one commonly used scale is the moment magnitude scale. The impact of earthquakes can be extensive, including triggering tsunamis if they occur under the sea and causing landslides. The initial point of an earthquake is called the hypocenter or focus, while the epicenter is the point on the earth's surface directly above the hypocenter.

Earthquakes are a type of disaster that cannot be precisely predicted, avoided, or prevented (National Earthquake Study Center, 2017). Earthquake disasters are often followed by tsunamis, which can cause significant material losses and fatalities. Therefore, preventive measures are required as emergency response and mitigation steps against earthquake disasters. Currently, the Meteorology, Climatology, and Geophysics Agency (BMKG) provides an earthquake repository accessible for free to the public through the website

<http://repogempa.bmkg.go.id/>. BMKG aims to provide quick and accurate earthquake information. However, the data available is only in *.csv format, making it difficult for users to visualize earthquake distribution in Indonesia and conduct data analysis. For the general public, information about the distribution, timing, and statistics of earthquakes is crucial, but users often face difficulties in downloading, processing, and presenting this data. Therefore, this research aims to visualize the history of earthquakes in Indonesia spatially and temporally through an interactive dashboard, enabling users to make visual queries when exploring the data.

Visualizing the history of earthquakes plays a vital role in conveying information to users to respond and make informed decisions. Effective visualization supports user understanding, whereas poor visualization choices can hinder effective information delivery. This research employs visual analytics methods, combining human data processing capabilities with computational power (Andrienko et al., 2010). Visual analytics integrates automated analysis with interactive visualization for effective understanding, reasoning, and decision-making on large and complex data (Keim et al., 2008).

Earthquake history data involves spatial, non-spatial, and temporal data. Visualizing spatial-temporal data using visual analytics methods is crucial for understanding the relationships between data points. This interactive visualization of earthquake history is expected to be an effective and efficient platform for basic decision-making and as an educational tool for the public to minimize earthquake disaster risks.

Kaimana Regency, as one of the regions in Indonesia, has abundant natural resources but also faces high natural disaster risks, especially earthquakes. The ongoing digital transformation has brought significant changes in various aspects of life, including the provision and access to information. The digital transformation era demands innovation in providing information, particularly seismic information related to earthquakes, to minimize disaster impacts and increase public awareness.

Kaimana Regency is geographically located in an earthquake-prone area. Therefore, the availability of accurate, fast, and easily accessible earthquake information for the public is crucial. In this context, an earthquake website is considered a means to provide easy access to seismic information for the public. An earthquake website has the potential to be an effective tool in disseminating information that can provide early warnings and proper action guidelines for the people of Kaimana Regency.

Although digital transformation has created new opportunities to improve information access, there is still a need to evaluate and optimize the use of this technology in the context of disaster mitigation in Kaimana Regency. Therefore, this research aims to explore the ease of information access in the digital transformation era through the development and optimization of an earthquake website in Kaimana Regency. With an optimized earthquake website, it is hoped that the people of Kaimana Regency will be better prepared to face earthquake disasters, reduce potential risks and losses, and increase public awareness and preparedness for earthquake disasters.

2. Research Method

This study can be categorized as qualitative research with a descriptive-analytical approach. This method aims to describe and analyze the phenomena being studied in depth and systematically. In the context of your research on the ease of practical information access in the digital transformation era through the utilization of the Earthquake website in Kaimana Regency, this approach is suitable for understanding how users utilize the website, the challenges faced, and its impact within the context of digital transformation in the region.

The study aims to provide empirically-based recommendations on ways to enhance the access and effectiveness of earthquake information through the Earthquake website in Kaimana Regency. The research findings are expected to serve as a reference for policymakers and relevant stakeholders in their efforts toward earthquake disaster mitigation, as well as to increase community preparedness and awareness of

earthquake risks. Thus, this research not only contributes to the development of scientific knowledge but also offers practical benefits for the community and local government in dealing with natural disasters.

3. Results and Discussion

3.1 Research Findings

The research indicates that Kaimana Regency is one of the regencies in West Papua Province, located on the western coast of Papua Island. This region has a high earthquake potential due to its location in the subduction zone of the Pacific Plate and the Australian Plate. The movement of these plates can trigger earthquakes of significant magnitude, placing this region within an earthquake-prone area.

Kaimana Regency, located on the western coast of Papua Island, is one of the areas in Indonesia with high earthquake potential. This is due to its geographical position in the subduction zone of the Pacific Plate and the Australian Plate. The movement of these plates can trigger earthquakes of significant magnitude. According to Afrina Prastiwi et al. (2022), this movement places Kaimana Regency at significant risk of earthquakes.

The earthquake potential in Kaimana Regency is very high based on data collected by the Meteorology, Climatology, and Geophysics Agency (BMKG). Kaimana Regency is located in the Subduction Zone of the Pacific Plate and the Australian Plate, with the potential for earthquakes reaching magnitudes of 8.0 or higher. History records several significant earthquakes in this area, such as a 7.6 magnitude earthquake in 2009 and a 7.2 magnitude earthquake in 2010. These earthquakes demonstrate the high earthquake risk faced by Kaimana Regency.

The impact of earthquakes in Kaimana Regency can be highly destructive. Earthquakes can cause building damage, landslides, tsunamis, and casualties. Maryanti et al. (2022) state that earthquakes in this region often cause significant damage, both materially and in terms of casualties. Therefore, preparedness for earthquake disasters is crucial for the community and local government.

3.2 Enhancing Earthquake Preparedness

Enhancing earthquake preparedness in Kaimana Regency requires joint efforts from various parties. The local government needs to undertake various mitigation measures, including strengthening infrastructure, conducting emergency response training, and providing easily accessible information to the public. Educating the community on steps to take before, during, and after an earthquake is also crucial to reduce risks and impacts.

Additionally, utilizing advanced information technology, such as early warning systems and mobile applications for earthquake information, can help the community respond quickly and accurately to earthquakes. Developing and optimizing the Earthquake website is a vital step in providing accurate and timely information to the public. Through this website, the community can obtain the latest seismic information and appropriate action guidelines for dealing with earthquakes.

3.3 The Role of Digital Transformation

In the era of digital transformation, utilizing technology for natural disaster mitigation, such as earthquakes in Kaimana Regency, becomes highly relevant. Innovations in providing information and educating the public are expected to increase awareness and preparedness for earthquake risks. Consequently, the negative impacts of earthquakes can be minimized, and community safety can be better ensured. This research aims to examine the ease of information access, the effectiveness of information dissemination, and efforts to improve the effectiveness of earthquake information dissemination through digital platforms, particularly the Earthquake website, in Kaimana Regency.

Digital transformation has significantly changed how people access information (Widi Linggih Jaelani et al., 2023). This change has increased the ease of information access in the digital transformation era. The following factors contribute to the enhanced ease of access to information:

1. Development of Internet Technology:

Internet technology has become the main medium for accessing information. With the internet, people can easily and quickly obtain information from various sources worldwide. This advancement has reduced geographical barriers and enabled real-time information access, facilitating global communication and knowledge exchange.

2. Advancements in Mobile Technology:

The use of mobile devices such as smartphones and tablets has increased. These devices allow people to access information anytime and anywhere. The ease of access through mobile devices provides users with high flexibility in searching for information, communicating, and interacting with digital content without being limited by time and place.

3. Development of Applications and Websites:

Various applications and websites have been developed to provide practical information to the public. These applications and websites are usually designed with user-friendly interfaces, making them easy to use for various user groups. Additionally, many of these applications and websites are accessible for free, enhancing information accessibility for the broader public. An example is the Earthquake website, which provides information quickly and efficiently.

3.4 Earthquake Website as an Information Source and Preparedness Tool

The Earthquake website is a comprehensive site providing information about earthquakes, including their location, magnitude, and potential hazards. This site is designed to be a valuable information source for the community to improve earthquake disaster preparedness (Maryanti et al., 2022). In this digital era, accessing information has become easier and faster. This also applies to information about natural disasters such as earthquakes. The Earthquake website serves as a reliable and dependable information source to help the community enhance their earthquake preparedness.

The Earthquake website provides various essential information about earthquakes, including:

1. Earthquake Location:

The website features an interactive map showing real-time earthquake locations. Information about earthquake locations is crucial for the community to determine whether their area is at risk. This interactive map allows users to monitor recent earthquakes and identify vulnerable areas.

2. Earthquake Magnitude:

The website provides information about earthquake magnitude measured on the Richter Scale or Moment Magnitude Scale (MMS). Information about the magnitude is essential because the higher the scale, the greater the potential damage. The community can use this information to understand the threat level and take appropriate preventive measures.

3. Potential Hazards:

The website also provides information on potential hazards caused by earthquakes, such as tsunamis, landslides, and building damage. This information is crucial for helping the community take necessary preventive and preparatory steps to minimize negative impacts.

3.5 Additional Features of the Earthquake Website

Besides the information mentioned above, the Earthquake website offers various other useful features, such as:

1. Earthquake Notifications:

The website can send real-time earthquake notifications to registered users. These notifications are helpful for the community to quickly take shelter during an earthquake. With these notifications, people can respond promptly and reduce the risk of injury or death.

2. Earthquake Preparedness Tips:

The website provides various earthquake preparedness tips, such as preparing an emergency plan, building safe shelters, and safely evacuating. This information is valuable for increasing the community's knowledge and skills in dealing with emergency situations.

3. Information on Earthquake Research:

The website also provides information on earthquake research conducted by scientists. This information can help the community better understand earthquakes and ways to reduce associated risks. This knowledge is essential for raising community awareness and preparedness for earthquakes.

3.6 Accessibility and Usability

The Earthquake website is freely and easily accessible via computers, smartphones, or tablets. The website is also available in various languages, including Indonesian, allowing it to reach a broader audience in different regions.

By using the Earthquake website, the community can enhance their earthquake preparedness and reduce the risk of casualties and property loss. This website is an essential information source for everyone living in earthquake-prone areas. Maximizing the use of this website will help the community be better prepared for earthquakes and reduce potential negative impacts.

3.7 Effectiveness of Earthquake Information Dissemination

The effectiveness of earthquake information dissemination is a crucial aspect of minimizing damage and casualties from earthquakes. Timely, accurate, and accessible information can help the community quickly take necessary rescue steps. The following are some important factors influencing the effectiveness of earthquake information dissemination:

1. Speed of Information Dissemination:

The speed of disseminating earthquake information is vital to ensure that the community can immediately become aware of the earthquake threat and take necessary rescue actions. Quickly disseminated information can provide enough time for the community to evacuate to safe places, prepare emergency needs, and protect themselves and their families. Efficient early warning systems, such as earthquake alarms and mobile warning applications, can play an important role in increasing the speed of information dissemination.

2. Accuracy of Information:

The accuracy of earthquake information is crucial to avoid panic and inappropriate actions. Inaccurate or misleading information can cause confusion among the community, ultimately worsening the situation. Therefore, agencies responsible for disseminating earthquake information, such as the Meteorology, Climatology, and Geophysics Agency (BMKG), must ensure that the information provided is verified and accurate. Using advanced seismic technology and real-time monitoring can help improve the accuracy of the information disseminated.

3. Accessibility of Information:

The accessibility of earthquake information is essential to ensure that all community layers, including those living in remote areas or with limited internet access, can receive information quickly and accurately. Information dissemination should be conducted through various communication channels, such as radio, television, social media, and other digital platforms. Additionally, efforts should be made to provide information in various languages and easily understandable formats for the broader community. Using mobile technology, such as text messages (SMS) and location-based applications, can help reach a wider community and ensure that earthquake information is accessible to everyone, without exception.

3.8 Efforts to Enhance the Effectiveness of Earthquake Information Dissemination Through the Earthquake Website

The Earthquake website can be an effective tool for enhancing the effectiveness of earthquake information dissemination in Kaimana Regency. Here are some efforts that can be undertaken to achieve this goal:

1. Developing a User-Friendly and Accessible Website:

To ensure that all community layers can utilize the Earthquake website, it is crucial to design a simple and intuitive interface. A user-friendly design will make it easier for users from various backgrounds, including those with limited knowledge of information technology. Using clear language and easy-to-follow navigation will enhance user comfort in accessing the needed information.

2. Providing Accurate and Reliable Information:

The accuracy and reliability of information are crucial aspects of earthquake information dissemination. The Earthquake website must present valid and trustworthy earthquake data obtained from official sources such as the Meteorology, Climatology, and Geophysics Agency (BMKG). Using the latest seismic technology and real-time monitoring can help ensure that the presented information is always up-to-date and accurate, making it a reliable reference for the community.

3. Expanding Website Reach:

To achieve a broader impact, the Earthquake website must be intensively promoted to the community in Kaimana Regency through various communication media. Social media, radio, and television can be used to introduce and educate the community about the existence and benefits of this website. An effective promotional campaign will increase community awareness and encourage them to utilize the website as the primary information source about earthquakes.

4. Utilizing Mobile Technology:

Given the high use of mobile devices such as smartphones and tablets, the Earthquake website should be optimized for these devices. Developing a responsive mobile version will allow users to access earthquake information anytime and anywhere. A dedicated mobile application can also be developed to provide direct notifications to users about recent earthquakes and emergency action guidelines.

5. Training the Community in Website Use:

To ensure the community can maximize the use of the Earthquake website, systematic training efforts are needed. This training can be conducted through workshops, seminars, or community education programs. With adequate knowledge, the community will be better prepared to use the website to obtain the information they need and take appropriate actions during an earthquake.

By implementing the above efforts, the Earthquake website is expected to become an effective tool in enhancing earthquake information dissemination in Kaimana Regency. This will help the community access accurate and timely information and improve their preparedness for potential earthquake disasters. Thus, the negative impacts of earthquakes can be minimized, ensuring the safety and well-being of the community.

4. Conclusion

The research findings indicate that the Earthquake website plays a crucial role in disseminating information about earthquakes in Kaimana Regency. This website provides real-time data on the location, magnitude, and potential hazards of earthquakes. Collaboration between the government, non-governmental organizations, and local communities enhances the effectiveness of disaster prevention and management. The information from the Earthquake website can be optimally utilized for practical actions on the ground.

However, challenges such as low digital literacy, limited internet access in remote areas, and a lack of awareness about the importance of information still hinder the optimal use of this website. To address these issues, educational and training programs are needed to improve digital literacy, enhance digital infrastructure, and conduct intensive and continuous awareness campaigns.

Overall, this research emphasizes the importance of the Earthquake website in earthquake mitigation and highlights strategic steps to overcome existing obstacles. With the proposed solutions, it is expected that the effectiveness of the website's use can be improved, thereby optimizing earthquake prevention and management efforts in Kaimana Regency.

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