

Augmented Reality Empowered Responsible Tourism: Leveraging Social Media Applications for Generation Z Tourists in the Yogyakarta

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Abstract: This research delves into the integration of augmented reality (AR) technology through Instagram filters to enhance responsible tourism practices. With a specific focus on Generation Z tourists in the Yogyakarta Special District, we recognize the importance of collective action in shaping the future of tourism. Despite the government's continuous efforts, responsible tourism implementation faces challenges, leading to cultural and environmental issues due to the increasing number of tourists. Leveraging the preferences and influence of Generation Z, this study proposes the application of AR through Instagram filters as a solution to engage and educate tourists on responsible tourism principles. The methodology involves the construction of AR system models and Instagram filter user interfaces, followed by observation and interviews with Generation Z users. The results indicate that AR filters can effectively convey information about cultural and historical assets, facilitate digital map navigation, and encourage Generation Z tourists to actively contribute to responsible tourism practices. This research underscores the significance of embracing innovative technologies to foster responsible tourism in the Yogyakarta Special District and emphasizes the collaborative nature of this endeavor, requiring the active participation of the government, tourists, and digital artists for sustainable tourism development.

Keywords: augmented reality; responsible tourism; generation Z.

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Introduction

Yogyakarta, a place where the tourist sector is a key driver of economic development (Anggraini, 2022), is a unique destination. Its rich culture and warm hospitality are its defining features, attracting both domestic and international tourists (Lubis & Zakiyyah, 2023). (Lubis & Zakiyyah, 2023). The number of visitors to the Yogyakarta Special District has been steadily increasing, even after the impact of the COVID-19 pandemic. In 2022, the district welcomed 19,981,651 visitors, a significant increase from the previous year's 10,661,974 (Central Statistics Agency of the Special Region of Yogyakarta, 2022). The booming tourism industry in Yogyakarta, driven by the unique blend of traditional and modern attractions, has had a profound impact on the local economy, with the tourism sector not only sustaining but also driving economic growth in the province (Simatupang, 2024).

As the number of visitors visiting a destination increases, there is a corresponding tendency for them to disregard cultural values and cause harm to the environment. (Khrisnamurti & Heryanti Utami, 2016). During its expansion, Yogyakarta's Special District encountered issues with tourists, including disregarding information boards at the Borobudur Temple. The citation is from a research paper by Wahyu Lestari and colleagues in 2018. This behavior does not align with the principles

of responsible tourism, which include conscientious tourists who possess knowledge about the local culture, demonstrate respect and sensitivity towards the hosts, and prioritize the preservation of the surrounding environment (Leslie, 2012; Lee et al., 2017).

The Government of Yogyakarta Special Territory, particularly its tourism department, is currently involved in a responsible tourism program. Unfortunately, the program has not achieved satisfactory results. Despite conducting regular socialization efforts in 60 locations within Yogyakarta's territories each year, its implementation still faces various challenges. Consequently, many tourists continue to overlook the principles of responsible tourism promoted by this initiative. The primary objective remains to ensure that services align with the region's unique attractions (Public Relations of the Special Region of Yogyakarta Government, 2023). Therefore, there is a need for improvement in promotional efforts and raising awareness among tourists regarding responsible tourism practices. Recognizing the importance of acquiring knowledge as a tourist remains crucial to minimizing violations incongruent with local culture or regulations while traveling in the Yogyakarta Special District. The potential application of augmented reality for digitizing information continues to be a viable option that could enhance the program's effectiveness.

Augmented Reality (AR) displays virtual information on top of the actual physical environment, precisely at its three-dimensional coordinates (Iliyas & Handriyanti, 2021). Augmented reality is employed for interpretation to enhance accessibility and enable tourists to interact with cultural items, hence promoting awareness of responsible tourism. Generation Z is strongly associated with technological advancements, significantly impacting their behaviors and cognitive processes (Aminah & Azlina, 2017). Augmented reality technology may effectively enhance Generation Z's interest in understanding concepts through interactive means. This, in turn, enables tourist attraction operators and tourists to engage in responsible tourism practices with the support and facilitation of the government.

Most tourists in the Yogyakarta Special District are still from the Indonesian region. The largest demographic group in Indonesia is Generation Z, including 64,842,700 individuals—the Central Statistics Agency of the Special Region of Yogyakarta (2023). According to Damanik et al. (2023), Generation Z tourists commonly utilize social media platforms to seek information regarding tourist sites. Efforts should be made to accommodate the preferences of Generation Z tourists, who have a strong influence, by providing them with easily accessible and engaging tourist attraction information that is now overlooked due to limited digitalization. The Z-generation travelers' comprehension of this scenario is severely lacking, resulting in frequent difficulties throughout travel.

Generation Z is less inclined toward print media literacy while displaying a heightened interest in internet-based media (Binangun & Satrya, 2021). Moreover, research has been carried out to investigate the utilization of augmented reality, which has demonstrated a beneficial impact on the current generation of students, commonly referred to as Generation Z. According to Wahyu et al. (2020), utilizing augmented reality in STEM education significantly enhances students' scientific literacy. Additional investigation indicates that using augmented realities in learning contexts enhances scientific publications (Techakosit & Wannapiroon, 2015). The importance of utilizing augmented reality (AR) in literacy lies in providing an innovative solution to enhance public understanding and interest in various literacy topics, thereby contributing to an overall improvement in literacy rates. An example of the urgency of this research could

be its aim to support the growth of Generation Z guest arrivals through the application of AR or to strengthen marketing strategies by leveraging this technology.

Methodology

The study constructed augmented reality systems models and designed user interfaces for Instagram filters. The study methodology employed is the utilization of observation and interview techniques. The observation entails examining the tourism phenomenon in Yogyakarta Special District. An interview was conducted with Generation Z, who were targeted explicitly as augmented reality users. The interview involved 20 respondents who are Instagram users who have previously utilized AR filters, selected through purposive sampling. The study technique used included interview questions and the application of Corel Draw software to create an augmented reality user interface. The methodology of this study consists of the following steps:

1. Performing a comprehensive evaluation of the library
2. Interview with a member of Generation Z who recently visited Yogyakarta Special Territory
3. Develop a user interface filter for augmented reality.

Results and discussions

Results

Challenges in the tourism sector in Yogyakarta Special District

Yogyakarta is a renowned tourism hotspot in Indonesia. This results in the uninterrupted continuation and dynamism of tourism operations. There is currently a significant amount of turmoil occurring in the tourism industry. Various infractions relating to tourism include acts of vandalism, unethical conduct within tourist areas, and failure to adhere to traffic regulations in proximity to tourist attractions (Puspitasari, 2021).

The government is actively taking steps to solve the issue by formulating the Regional Regulations on the Master Plan for the Development of Tourism in the Yogyakarta Region for 2015-2025. However, it is suboptimal, particularly about the security of tourists. Within the trigger problem framework, the absence of assistance from the tourism literacy structure has hindered the ability of the current tourist infrastructure to handle trigger issues related to tourist attractions properly. The citation is from Yarmanto et al. (2023). Augmented reality can enhance the tourist experience in the Yogyakarta Special District by providing supplementary information and engaging digital material.

Discussions

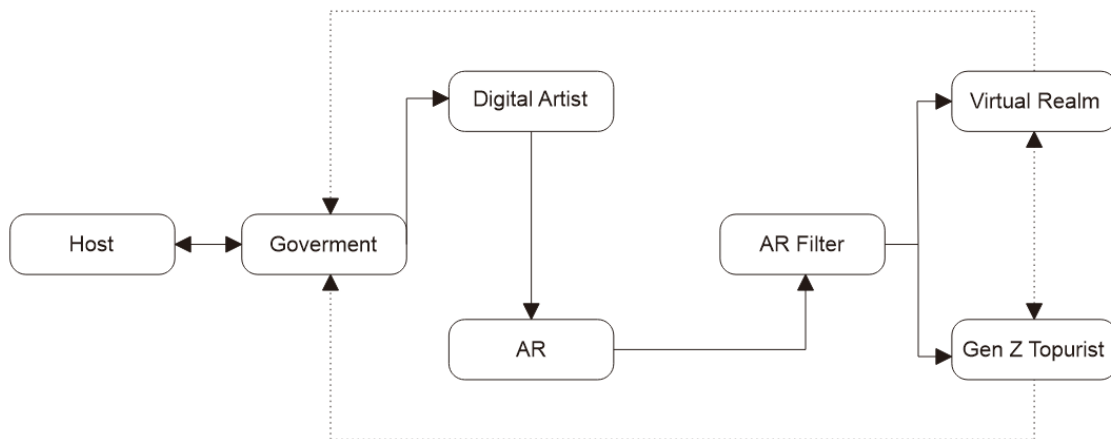
Application of Instagram Filters Utilizing Augmented Reality in Yogyakarta Special District

As a means of interpretation, augmented Reality (AR) aims to augment the comprehension of responsible tourism among the current generation of tourists. This approach aligns with the responsible tourist behavior framework proposed by Kang and Moscardo (2006), which includes:

1. Acquire knowledge and comprehension of the Indigenous culture
2. Engage with the indigenous population and gain insights into their way of life.
3. Adherence to local culture and customs
4. Adhere to the social norms and regulations of the locations I frequent.

5. Comply with the regulations of environmental preservation that are in effect in the locations I visit.
6. Acquire knowledge, comprehend the surroundings, and engage in environmental education initiatives.
7. Refrain from accessing websites that have the potential to cause harm to the environment.
8. Utilization of eateries and lodging establishments overseen by indigenous individuals.
9. Ensure a portion of my expenditures is allocated to nature conservation funds.
10. Ensure that a portion of the funds I expend is allocated to the local welfare fund.

The platform used to implement augmented reality in this context is Instagram, as Generation Z favors it for information retrieval. The citation is from Damanik et al. (2023). The Instagram filter is the feature utilized for the item scanning procedure. The following outlines how augmented reality is utilized in Instagram filters for media interpretation.



(Source: Ramadhan, 2023)

Figure 1. Augmented Reality Filter Framework

The host, Winisatawan, and the government of Yogyakarta Special District should collaborate to incorporate augmented reality. The government enlisted scientists for training or commissioned digital artists to develop an Instagram augmented reality filter.

Subsequently, the government can disseminate it across the digital realm, specifically on Instagram, to facilitate accessibility for tourists belonging to the Z-generation. As members of Generation Z, tourists can utilize the object scan feature to access information about various tourist attractions. For instance, scanning an arch or statue will provide details on the statue itself and guidelines on appropriate behavior.

Furthermore, tourists belonging to the Z-generation can publish Instagram stories that include reviews or information regarding tourist attractions. Instagram, functioning as a digital realm, can facilitate reciprocal engagement for the sake of interpretation. Instagram may also provide feedback in the virtual realm, particularly on the development of augmented reality filters for the government and the younger generation known as Generation Z. The government will persist in refining the filters to align with the requirements of forthcoming Z-generation tourism.



(Source: Ramadhan, 2023)

Figure 2. Utilize an Augmented Reality Filter to Facilitate Interpretation

The Instagram filter design represents and reflects the distinctive cultural elements of the Yogyakarta Special District. Moreover, content exhibits what is permissible and impermissible about cultural or historical assets. The application utilizes scanning techniques to identify arches or cultural assets and displays relevant content explaining the scanned heritage.



(Source: Ramadhan, 2023)

Figure 3. Utilizing Augmented Reality for Digital Map Navigation

Moreover, QR code implementation can be utilized for digital map navigation by employing filters. Digital maps can include transportation accessibility and micro, small, and medium enterprises (UMKMs) located near tourist spots equipped with QR codes. The program can be installed in either a tourist information center or a high-traffic location to enhance accessibility for travelers.

Conclusions

The Yogyakarta Special District possesses immense potential as a tourism destination, bolstered by the rich culture and warm friendliness of its inhabitants.

Nevertheless, the growing influx of tourists poses issues in maintaining cultural and natural integrity. An ideal method to address this issue is to utilize augmented reality (AR) technology, which employs Instagram filters. Most Indonesians comprise Generation Z. This technology can effectively engage Generation Z and enhance their awareness of responsible tourism.

The Yogyakarta Special District Government should continue promoting collaboration with tourists to embrace augmented reality. Providing assistance and instruction to digital artists will empower them to produce captivating and informative Instagram filters collaboratively. It is crucial to guarantee that the information and interpretation delivered via the augmented reality filter is consistently current and aligned with the requirements of the Z generation. These steps are anticipated to assist the Yogyakarta Special District cultivate responsible tourism among visitors, particularly the Z generation, by fostering an appreciation for local culture and promoting environmental sustainability.

AR technology integration provides a novel method for preserving culture in tourism and also acts as a potent instrument for involving and educating the younger generation about responsible tourist practices. Yogyakarta Special Region may provide a sustainable and culturally rich tourism experience for local people and visitors by consistently updating and matching the most comprehensive reality information with the preferences of Generation Z.

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