

Socialization of Virtual Reality Utilization as a Promotional Tool by the Tourism Office in the Deli River Area

Sutrisno Arianto Pasaribu¹, Victor Maruli Pakpahan², Dompok Pasaribu³, Nidya Banuari^{4*}, Roni Juliansyah⁵, Budianto Tandianus⁶, Brandon Gui⁷, Cherie Sthefany Aritonang⁸

^{1,2,4,5,8}Universitas Mahkota Tricom Unggul

³Universitas Methodist Indonesia

^{6,7}Institut Teknologi Singapura

Corresponding Author: Nidya Banuari ndybanuari@gmail.com

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ABSTRACT

This Community Service activity aims to educate the public while promoting tourism potential and environmental conservation in the Deli River area, Medan City, through the utilization of Virtual Reality (VR) technology. The theme of green culture is highlighted as a core value within the VR content, which features local historical narratives, environmentally friendly practices, and community-based tourism potential. Data was collected through field observations, semi-structured interviews, perception questionnaires regarding the VR content, and documentation of the activities. The results indicate that the use of VR is effective in increasing public understanding of the importance of river conservation while also strengthening the image of local tourist destinations. This international collaboration also demonstrates the significant potential of immersive technology approaches in supporting sustainable development through community participation.

INTRODUCTION

Tourism is one of the strategic sectors that plays a significant role in regional economic development, cultural preservation, and the creation of local identity. In the context of the Deli River area in Medan City, the potential for natural and cultural tourism has not yet been fully explored or optimally promoted. One of the main challenges lies in the lack of innovation in delivering educational, engaging, and sustainable tourism information to both visitors and local communities. Therefore, a creative, technology-based approach is needed to enhance the appeal of the area while reinforcing local values, green culture, and environmental conservation.

The Community Service activity with the theme "Overseas Social Innovation on Deli River Tourism Project" was carried out through a collaboration between Universitas Mahkota Tricom Unggul (MTU) and the Singapore Institute of Technology (SIT). This initiative aims to introduce a tourism promotion concept based on Virtual Reality (VR) technology that integrates elements of education, cultural preservation, and environmental awareness. The involvement of SIT students in this program plays a pivotal role in fostering international collaboration that combines global perspectives with local values.

SIT students contributed not only to the development of technological content but also took part in designing communication approaches that highlight local culture and green culture principles. Green culture, as promoted in this activity, emphasizes the importance of fostering community awareness of environmentally friendly behavior, natural resource conservation, and the preservation of river areas as living ecosystems.

VR was chosen as the main medium due to its capability to deliver immersive visual and educational experiences, showcasing the Deli River from multiple perspectives: its natural beauty, pollution threats, potential for community-based tourism, and the local culture that coexists with the river. In addition to serving as a tourism promotion tool, the implementation of VR in this project was also designed as an educational platform for the community and younger generations on the importance of environmental conservation as a part of cultural heritage.

Through this program, the local communities around the Deli River were actively involved in the creative process and technology training, resulting in knowledge transfer and the sustainable improvement of digital literacy. This initiative also functioned as a means of empowering local communities to become active participants in environmentally conscious tourism management. Based on this background, the research and community service project aims to design and implement a Virtual Reality system as a tool for education and tourism promotion, guided by the spirit of green culture and community empowerment. This international collaboration is expected to serve as a best-practice model for the development of technology- and community-based tourism that is not only visually appealing but also rich in educational, ecological, and cultural values.

IMPLEMENTATION AND METHODS

This community service activity adopts the Participatory Action Research (PAR) approach, which emphasizes the active involvement of local communities and international partners in the design, implementation, and evaluation of the program. This approach was chosen to ensure the co-creation of knowledge and the sustainability of benefits for the communities surrounding the Deli River.

Location and Activity Subjects

The activities were conducted in the tourism and residential areas surrounding the Deli River in Medan City, North Sumatra, as illustrated in the image below:

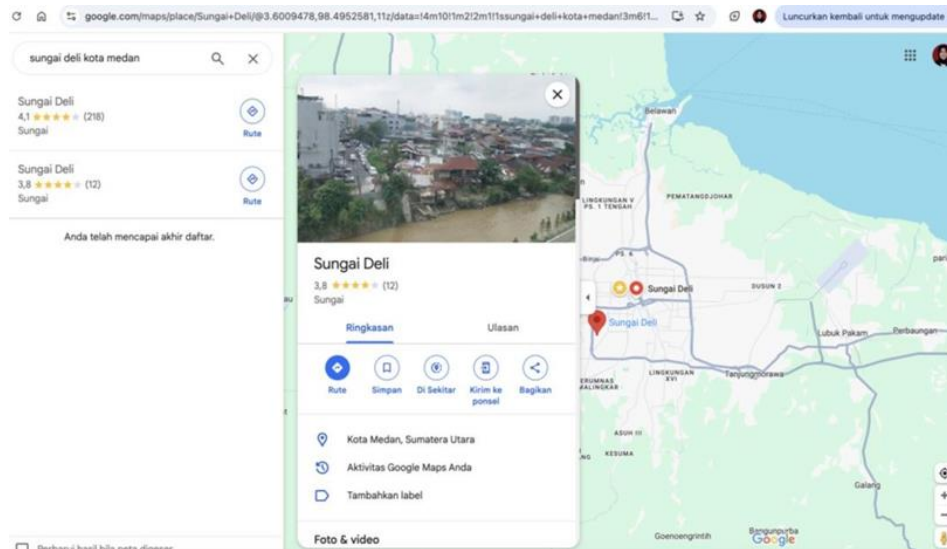


Figure 1. Activity Location

The subjects involved in the activity are as follows:

1. Local community members (including community leaders, youth, and MSME actors), who provide valuable insights into the history, local culture, and tourism potential of the Deli River. They also articulate the needs and aspirations of the community related to the development of educational tourism and environmentally sustainable initiatives.
2. Representatives from the Tourism Office, who contribute by offering policy guidance and support in the planning of digital tourism promotional content. They serve as partners in the validation and feasibility testing of the outputs (i.e., VR content), and are expected to consider and possibly adopt policy recommendations derived from the community engagement activities.
3. Students from Universitas Mahkota Tricom Unggul, who serve as local facilitators, bridging communication and collaboration between the community and international partners. They are actively involved in documentation, VR content development, and the implementation of field activities, while also enhancing their collaborative and technical competencies through participation in this technology-driven service project.

4. Students from the Singapore Institute of Technology (SIT), who participate as international partners within the framework of an International Service- Learning program. They are engaged in designing educational content, developing storyboards, and incorporating green culture narratives into the VR experience. Their involvement provides cross-cultural perspectives and innovative approaches to the development of tourism promotion media.
5. The faculty implementation team, who oversee and facilitate all phases of the service activity. They provide guidance in problem identification, solution design, and VR content development, as well as conducting impact evaluations and preparing academic reports and publications.

The activity was carried out through the following stages:

1. Problem and Potential Identification
Direct observation and focus group discussions (FGDs) were conducted to identify issues related to tourism, environmental education, and cultural preservation in the area surrounding the Deli River.
2. Workshops and International Collaboration
Workshops using a co-design approach were held, where local participants and SIT students collaboratively designed educational content and virtual tours based on the concept of green culture, under the guidance of the faculty team.
3. Development of Virtual Reality Content
The Virtual Reality (VR) content was designed to deliver interactive educational narratives and tourism promotion to the public, especially to communities around the Deli River. The content was developed with a strong emphasis on green culture and local heritage as its core themes.
4. Simulation and Testing
The VR content prototype was tested with local communities and representatives from the tourism office. Evaluations were conducted through questionnaires and interviews to assess the effectiveness and potential adoption of the technology.

Data Collection Techniques

The data collection techniques employed in this activity are as follows:

1. Field Observation
This technique involved direct observation of the environmental conditions, tourism potential, and community activities surrounding the Deli River. The aim was to obtain factual and in-depth data regarding the actual situation on site.
2. Semi-Structured Interviews
Interviews were conducted with community leaders and relevant stakeholders (such as the Tourism Office and MSME actors) using a set of open-ended questions. This technique allowed for a flexible and in-depth exploration of their opinions and perspectives.

3. Evaluation Questionnaires

Questionnaires were distributed to respondents after experiencing the Virtual Reality content, to measure their perceptions regarding the clarity, appeal, and educational and promotional value of the VR content.

4. Documentation

Throughout the entire activity, photos and videos were taken as supporting data, which also served as material for promotion and reporting of the community service initiative.

RESULTS AND DISCUSSION

This Community Service activity was carried out in several stages, encompassing the identification of potential, content planning, development of Virtual Reality media, as well as implementation and evaluation. The initiative was launched through inter-institutional collaboration between Universitas Mahkota Tricom Unggul, the Singapore Institute of Technology, with the support of the Medan City Tourism Office and the local Deli River community.

Preparation and Identification

Field observations were conducted at several strategic points along the Deli River to identify existing conditions and tourism potentials that could be developed. Focus Group Discussions (FGDs) were also held with local stakeholders, community leaders, and MSME actors to gather information on local history, culture, and environmental issues.



Figure 2. FGD Activity with Stakeholders and the SIT Team

Virtual Reality Content Design

Based on the results of observations and interviews, the team designed the VR content scenario using a green culture approach. The content focused on the historical narrative of the Deli River, tourism spots, environmental education, and community testimonials. Students from the Singapore Institute of Technology actively participated in collecting 360° footage, creating the storyboard, and developing interactive content features.



Figure 3. Spot Content Design Activities

Content Production and Design

The Content Plan will be developed using camera equipment and Unity software. The Content Design will then be tested with the local tourism office and stakeholders. During the trial, stakeholders will be asked to provide feedback and suggestions on the content being developed, assessing whether it aligns with the intended objectives.



Figure 4. Content Design Activities

Evaluation

Based on the evaluation and follow-up interviews, the majority of stakeholders stated that the VR content helped them understand the importance of maintaining river cleanliness, learn about the history of their area, and foster a sense of pride in the Deli River region. The Tourism Office expressed appreciation for this approach and opened up opportunities for integrating the content into regional tourism promotion media.



Figure 5. Evaluation Activities with Stakeholder and SIT Team

Documentation and Dissemination

The entire process was documented in the form of photos, videos, and reports. In addition, the results of the activities were presented to government agencies and the community during an open discussion session. The documentation was also used for scientific publication purposes and on social media to increase the outreach and impact of the activities.



Figure 6. Documentation

CONCLUSIONS AND RECOMMENDATIONS

The community service activity themed "Utilizing Virtual Reality as a Tool for Education and Tourism Promotion among Communities Around the Deli River" was successfully carried out through a collaborative effort involving faculty members, local students, and international participants from the Singapore Institute of Technology. Through a participatory approach, this initiative not only identified the tourism potential and environmental issues surrounding the Deli River, but also produced an educational and green-culture-based Virtual Reality content plan.

The use of VR technology proved effective in strengthening historical narratives, introducing local tourist spots, and raising community awareness about the importance of environmental conservation. Evaluation results showed that stakeholders felt supported in understanding and promoting their region's potential in a more engaging and modern way. Appreciation from the Tourism Office and their openness to integrating the content into official promotional media serve as key indicators of the success of this approach.

The dissemination of results through documentation and public presentations expanded the impact of the activity while also opening up opportunities for further content development and its application in other regions with similar characteristics. Cross-cultural collaboration and the use of cutting-edge technology provided added value in supporting sustainable tourism development and community-based environmental education.

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