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## Development of a Local Wisdom Mapping Application to Support P5 Learning at SMA Negeri 5 Bandung

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### Abstract

*Local wisdom is a valuable national cultural asset that needs to be preserved. We can initiate an effort to preserve local wisdom by disseminating it to the broader community through comprehensive and precise information. However, Indonesia has not yet effectively managed local wisdom information, forcing individuals to scour the internet for various sources. On the other hand, the education sector also places significant emphasis on local wisdom, incorporating it as a key theme in the implementation of the P5 (Projek Penguatan Profil Pelajar Pancasila) program in schools. P5 is a project-based learning approach that has become mandatory from the latest education curriculum (Kurikulum Merdeka). Through teamwork, P5 assigns students to study a specific subject or social or cultural phenomenon. This assignment culminates in the presentation of a report or a specific product. P5 typically collects reports and information in hard copy form, only archiving them at the school, making it challenging for both students and the wider community to access them. Indeed, easy access to the collected information would greatly enhance its usefulness. Based on the aforementioned conditions, we proposed a solution that involves building and implementing a local wisdom mapping application for the storage of digital data. The P5 programs at Senior High School 5 (SMA Negeri 5) Bandung, which selected local wisdom as a specific theme for P5, serve as the data source for this application. It is expected that the presence of this application can support the P5 learning process by facilitating digital storage of research results and disseminating the results to a wider community. We conducted this study using the canonical action research method. Two classes of 10th-grade students participated in the implementation and socialization phases of the pilot project. They can input a location and complementary information such as related photos and videos and complete student research reports. It helps the student keep their work published and reachable by the broader community. The evaluation results demonstrate the application's ease of use and benefits for students and the school.*

**Keywords:** Implementation; Kurikulum Merdeka; local wisdom; mapping; project-based learning; P5.

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### 1. Introduction

Along with implementing the *Kurikulum Merdeka*, as the latest curriculum for elementary and high school in 2021, the teaching and learning process in schools, especially junior and senior secondary schools, has experienced significant changes. One of the concepts applied in the *Kurikulum Merdeka* is freedom of learning for students, and one of them is implementing the program *Projek Penguatan Profil Pelajar Pancasila* (P5). Through P5, it is hoped that students can pay attention to and provide solutions to environmental or social problems. The implementation of P5 is divided into six phases, from A to F, covering primary education (SD) to further education (SMA). Phases A to C are for the basic education level, phase D is for the junior high school level, while phases E and F are intended for the high school level. In phases E and F, each school is

required to choose and determine three themes in one year. The themes in phases E and F are Sustainable lifestyle, local wisdom, Bhinneka Tunggal Ika, Build your Body and Soul, Voice of Democracy, Engineering, and Technology to Build the Republic of Indonesia and Entrepreneurship (*Buku Pendamping Implementasi Kurikulum Merdeka SMA Jatim*, 2022) . The selected themes demonstrate the government's support and concern for issues in related fields, as well as providing opportunities for students to explore these fields. The availability of local wisdom as a theme choice demonstrates the government's commitment to introducing and preserving it among the younger generation.

Implementation of P5 is carried out using a project-based learning (PBL) approach (Berlianti & Jatningsih, 2023) . Students are divided into several groups, and each group is asked to determine one research object according to the theme chosen by the school. The results of P5 activities are in the form of student research reports or products that are relevant to the object being studied. Reports and documentation relating to P5 are generally stored in hardcopy form within the school environment. This condition is unfortunate, considering the amount of time, energy, and costs spent collecting the data in the report, as well as the value of the information collected by the students, which could be very useful for other students and the wider community.

We have not yet discovered any initiative or system that can digitally store P5 documentation for easy access by the school, both internally and externally. A search using the keyword "Laporan P5" on the internet produces data in the form of implementation reports made by teachers and the implementation team, while only a few reports made by students were found. Shared documents like scribd.com, flipHTML5.com, and anyflip.com typically store these reports. The same thing also happens with the theme of local wisdom. Reports on P5 activities related to local wisdom are still difficult to find, as is information from various other public sources. In general, information about local wisdom can be found on the internet and spread across various sources in different forms. Promotional sites, like those promoting tourism or cuisine, host some of them. However, the information they provide is often insufficient, lacking details such as the location, timing, and philosophical concepts of local wisdom. On the other hand, local wisdom is crucial for the sustainability and cultural identity of a nation (Sonhom & Taravet, 2023) , so it needs to be preserved. Therefore, the availability of information about local wisdom can help the general public get to know, find out more, and even learn about local wisdom, for example, by visiting the location directly.

In addition to gathering documents, the theme of local wisdom necessitates the addition of photos, videos, and locations where local wisdom is prevalent. This additional information will be very helpful for all parties who want to know about local wisdom. Presenting the location information visually and spatially will enhance its interest, enabling people to learn about local wisdom in specific areas and understand how to reach them. This location information can also help promote local wisdom in the wider community.

We can define local wisdom as a practice that stems from the knowledge or experience of a community group, rooted in tradition or culture, and implemented in daily life. Local cultural values embody this wisdom, organizing people's lives and enhancing their wisdom. This culture typically transmits from one generation to the next (Purba et al., 2020) . There are several forms of local wisdom, such as traditional traditions and ceremonies, buildings, traditional games, art, musical instruments, or traditional culinary delights (Yuliani & Irham, 2022). Some examples of local wisdom in West Java include Cingcowong ceremony (Komalasari et al., 2021), Nujuh bulanan (traditions and ceremonies), Candi Jiwa (Muhamad Ridwan & Meitasari, 2023), Rumah adat tagog anjing (building) (Nuryanto, 2021), congklak, gobak sodor (traditional games), and many more.

Previous research on P5 and local wisdom is generally limited to discussing the results of designing and implementing P5 for students, both at the elementary school level (Sulistiyaningrum & Fathurrahman, 2023), and high school (Berlianti & Jatningsih, 2023), obstacles and supporters of implementing P5 (Maharani et al., 2023), benefit of P5 for students (Kholidah et al., 2022; Rahmadani et al., 2023), and effectivity of P5 program to introduce the local wisdom (Fitriasari et al., 2023) . The results of specific research on mapping local wisdom are typically restricted to a small number of locations and take the form of a list of local wisdom facts without any spatial information on the locations of the local wisdom, as in the case of mapping local wisdom

in Cintaratu Village. (Permana et al., 2020), culture mapping in Giritengah Village, Borobudur (Fatimah et al., 2019), and education on local culture in Tojo Una-Una Regency (Labolo et al., 2022).

The importance of mapping local wisdom has also been stated in several previous studies. Researchers have conducted research in Gajah Bertalut village (Ridhwan et al., 2021) to map community territories and aid in land-use planning, while (Agustina et al., 2020) mapped the Kanoman palace area in Cirebon. Dewi et al., studied the Sasak and Osing tribes to understand the connection between spatial patterns and their perspectives on environmental protection (Dewi et al., 2022), and (Rakuasa et al., 2023), produced a map of marine life in the research region. Julianti Tou et al. (Julianti Tou et al., 2020) also highlighted the necessity of mapping local wisdom to support tourism development in rural areas.

SMA Negeri 5 Bandung, as one of the state schools, implements P5 in accordance with the guidelines and directions from the Ministry of Education and Culture. Local wisdom is one of the themes selected for the third P5 implementation in the 2023-2024 academic year for 10-th grade. In practice, the existing classes are then divided based on the region or province of observation; for example, classes are assigned to highlight local wisdom from Central Java, Central Kalimantan, West Sumatra, West Java, and others. Because the location of SMA Negeri 5 Bandung is in the West Java region, the school chose two classes to explore local wisdom from West Java Province. SMAN 5 Bandung stores the results of student reports as printed reports, which poses challenges for teachers and other students to access or trace. These printed reports also pose challenges in managing research topics, such as preventing repetition of topics, duplication of topics across different classes, or plagiarism of reports from other groups. Therefore, having digital document collection facilities will be very helpful for schools to manage P5 activities.

This research aims to build and implement an application to document the results of student reports in the P5 program, with a particular focus on the theme of local wisdom. We chose this theme due to its potential to significantly enhance the community's access to local wisdom information. In addition to reports, this application will incorporate supplementary features like photos, videos, and locations where local wisdom is accessible. The local wisdom location data is then presented spatially in the form of a map so that it can give the public an idea of the local wisdom in a particular area. We hope this application will assist the wider community, particularly tourists, in gaining knowledge about local wisdom in West Java and throughout Indonesia. It serves not only as a means of recording P5 research findings, but also as a channel for educating people in general about local wisdom.

## 2. Research Method

This research was conducted by employing the Canonical Action Research (CAR) approach. The CAR approach has five interconnected stages, as established by Susman (1983) and cited in the research conducted by (Przybyłek et al., 2022) : diagnosis, action planning, action implementation, evaluation, and learning specification. Subsequently, we condensed these five processes into three distinct stages for the execution of this research: preparation, application development, and socialization and implementation. Figure 1 illustrates the correlation between Canonical Action Research and the various stages of this research.

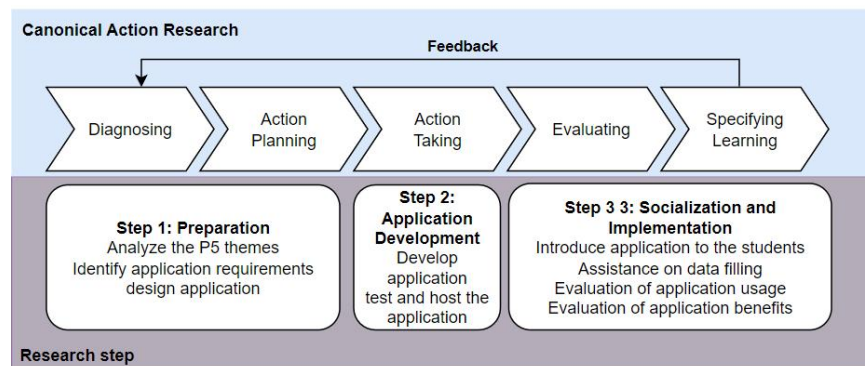


Figure 1. Adaptation of Canonical Action Research Method into Research Step  
(Source processed by researchers, 2024)

Afterwards, we adjusted the approach for conducting this study by aligning each phase with the tasks performed in this research, as illustrated in Table 1.

Table 1. Research step and activity (Source processed by researchers, 2024)

CAR Phases	Activities	Adapted in research Activities	Steps	Output
Diagnosing	Diagnose the current situation, identify the primary problem and reason for change or improvement	Diagnose the condition of the existing P5 execution, which produces many reports in hard copy form with no facilities to document them. Several groups choose similar topics, etc.	Preparation	Analyze the P5 theme's breadth and identify each class's observation topic.
Action planning	Researcher, client and practitioner, plan actions to address the problem	Discussion among researchers, teachers, and school administrators to create a system to document local wisdom. Implementing an integrated system with the existing P5 program.		<ol style="list-style-type: none"> <li>1. Identify the requirements for the application</li> <li>2. Design of applications</li> </ol>
Action taking	Executed the plan	Build and test the system	Application Development	<ol style="list-style-type: none"> <li>1. Development of web-based applications</li> <li>2. Application hosting</li> <li>3. Testing</li> </ol>
Evaluating	Determining the expected effect of an intervention is achieved, and the impact of effect on the problems	Implement the system in a pilot project, and evaluate the result.	Socialization and implementation	<ol style="list-style-type: none"> <li>1. Introduce application to the students</li> <li>2. Assistance on data filling</li> </ol>
Specifying learning	Reflect on the intervention and its effect, finding, reaching the decision about next actions.	Lesson learned and giving recommendation		<ol style="list-style-type: none"> <li>1. Evaluation of application usage</li> <li>Evaluation of application benefits</li> </ol>

### 3. Results

Local wisdom is the theme that will be chosen in accordance with SMAN 5 Bandung's P5 implementation plan. Due to the integration of P5 and research, the school separated class 10 into multiple observation areas, such as Yogyakarta, North Sumatra, Central Java, West Sumatra, West Java, and other areas. Because West Java will be the target research respondent, two classes were selected as the pilot project specifically for this region. Six groups, each with six pupils, were formed in each class. Furthermore, the discussion topics that each group selects must not be the same in a class. For instance, six subjects were selected for the class: *Topeng* dance, traditional herbal medicine for cancer treatment, *Angklung*, *Surabi* (a kind of pie cake) from Bandung, Cirendeu Traditional Village, and the traditional weapon *Kujang*. The design of applications and recording of student research findings are the main topics of this study. Each chosen theme's ultimate product is also decided at this planning step, as shown in Table 2.

The availability of local wisdom information that is accompanied by maps is one of the applications demands that may be determined based on the prior description. The P5 report's outcomes will be recorded using this

application. Table 3 shows a breakdown of the elements that will be part of the local wisdom mapping application.

Tabel 2. Theme and final research output for each group  
(Source: X-D P5 Plan, SMA Negeri 5 Bandung, 2024)

Group	Theme	Final Output
1	Cireundeu Traditional Village	A documentary movie about Cireundeu village
2	Surabi Bandung	The display consists of <i>surabi</i> as main course accompanied with other traditional food.
3	Angklung	The display shows the angklung, an infographic for explaining angklung and the complementary accessories.
4	Kujang (traditional weapon)	The display shows the Kujang as a traditional weapon, as well as infographics and other accessories.
5	Traditional herbal medicine for cancer	The display shows the infographic about ingredients and the benefits of herbal ingredients, and herbal medicine samples.
6	Topeng Dance	The display shows a complete costume of Topeng Dance, and dance performances.

Tabel 3. Key Features and functionalities on local wisdom mapping application  
(Source processed by researchers, 2024)

No	Features	Functionalities
1	Entering local wisdom information	Entering information about Local wisdom and its location details include the following: group identification (group number), local wisdom's name, description, location, operating hours, and photographs.
2	Grouping local wisdom	Classifying and grouping the local wisdom based on: Location, and type of local wisdom (dance, culinary, building, games, etc.)
3	Searching information	Searching local wisdom information based on certain keywords such as the city name, location, or certain features.
4	Read review or send comentar	For accommodate the user who wants to add some comments to add some of information apart from that already available

The features above are then realized as a local wisdom mapping application that users can access according to their respective roles, as seen in the use case diagram in Figure 2.

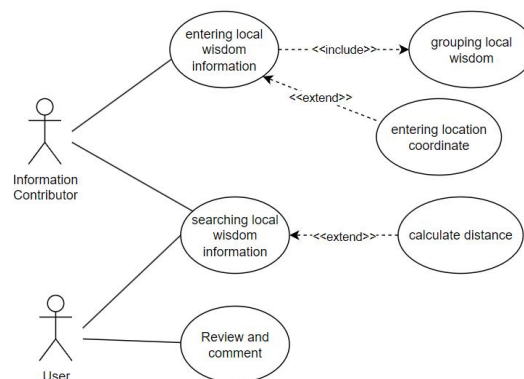


Figure 2. Use case diagram local wisdom mapping application

Based on the features above, we design the interface and user flow using *whimsical*, as shown in Figure 3. The screen flow and the user interface were written in Bahasa and grouped based on user's role. We can identify the necessary information using the previous functionality, as shown in Table 3.

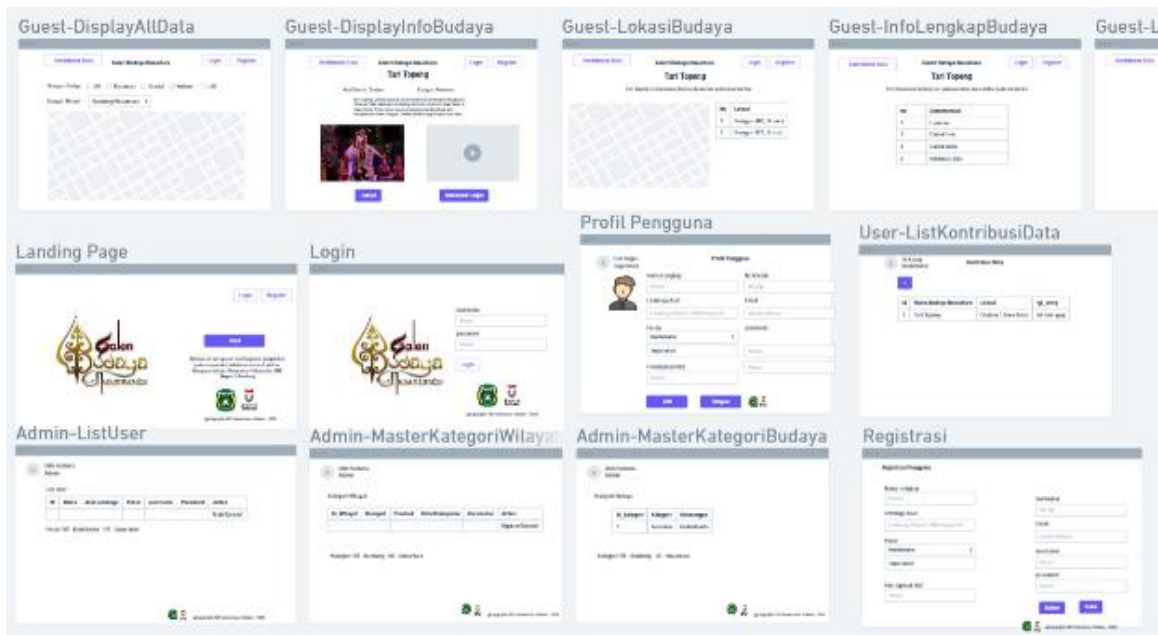


Figure 3. Design of user interface

Tabel 4. Identification of data required (Source processed by researchers, 2024)

No	Entities	Description
1	Local wisdom object	Object name, description, location, related photos and videos.
2	Location of local wisdom object	Spatial position of local wisdom can be found, and the possibility to fill data for several locations.
3	Research report	An electronic document research report contains detailed information about selected local wisdom.
4	Identity of users (contributor or supervisor)	Information about the users which has roles as contributors (students) or supervisors on data entry (teacher/ facilitator)

Figure 4 illustrates the correlation between data items in the table layout. We wrote the table name and the field in Bahasa.

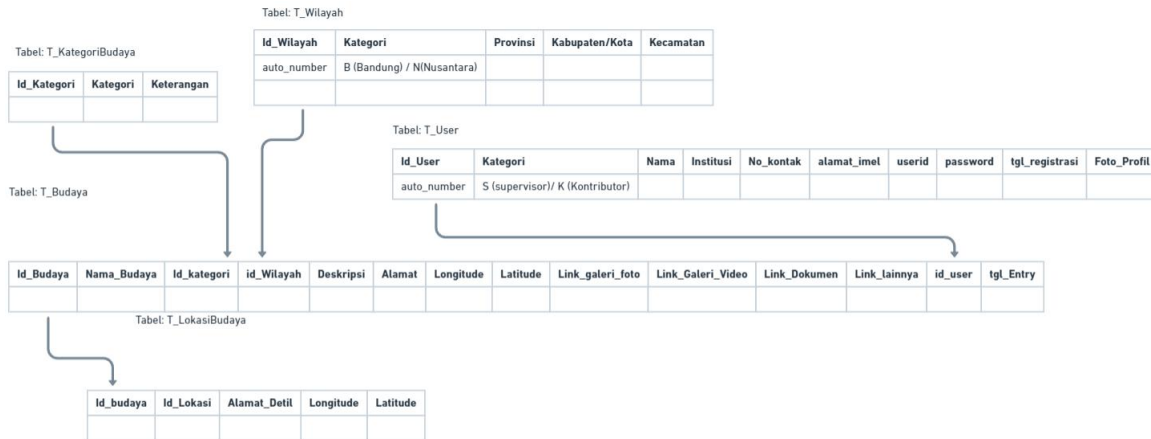


Figure 4. Design of Table Relation

In the second stage, the application is developed based on a previously prepared design. The application is made in two versions, namely web and mobile versions. The web version was then published via the domain <https://indonesianculture.org>.

The initial appearance of the web version of the application provides features for registering and logging in for contributors' data entry needs. Figure 5 shows the initial appearance of the application. All descriptions in this application were written in Bahasa.



Figure 5. Landing page of local wisdom mapping application

Users can access the local wisdom data that has been entered by clicking the "Start" button. Figure 6 displays a map of local wisdom positions that contributors have entered. Because the data for testing is generally local wisdom data in the Bandung City area, the display can see a large number of pinpoints in the Bandung City area. If you click on this point, a panel will open displaying the main information related to the local wisdom in question, namely a short description, relevant photos, and videos (Figure 7). The Location button is used to display detailed information on locations where local wisdom can be found (Figure 8), while detailed information on student research results can be seen on the 'Further Information' page (Figure 9).



Figure 6. Map of local wisdom location for Bandung area.

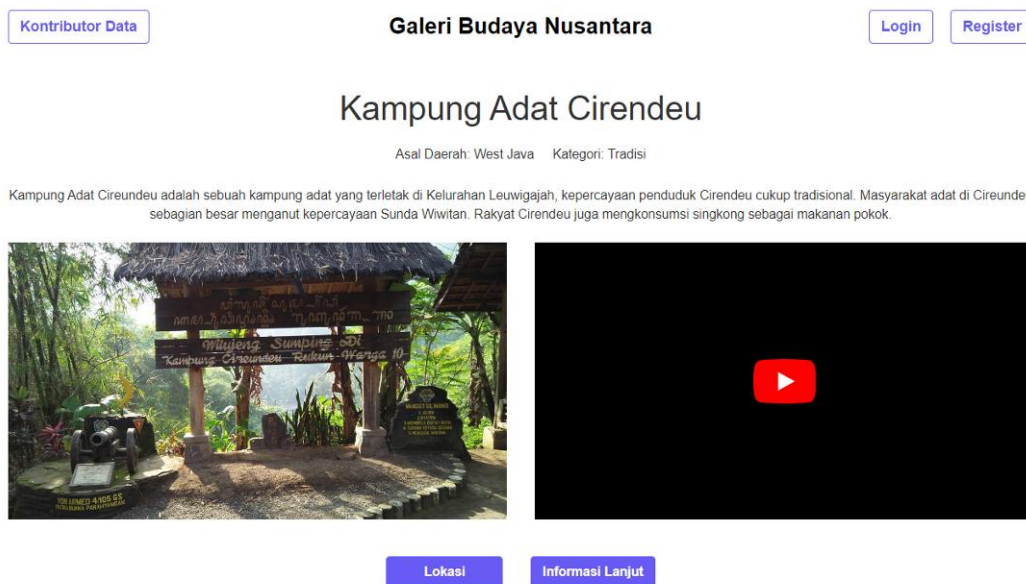


Figure 7. Main information about a local wisdom



### Kampung Adat Cirendeou

Kampung Adat Cirendeou dapat ditemui/disaksikan pada lokasi berikut

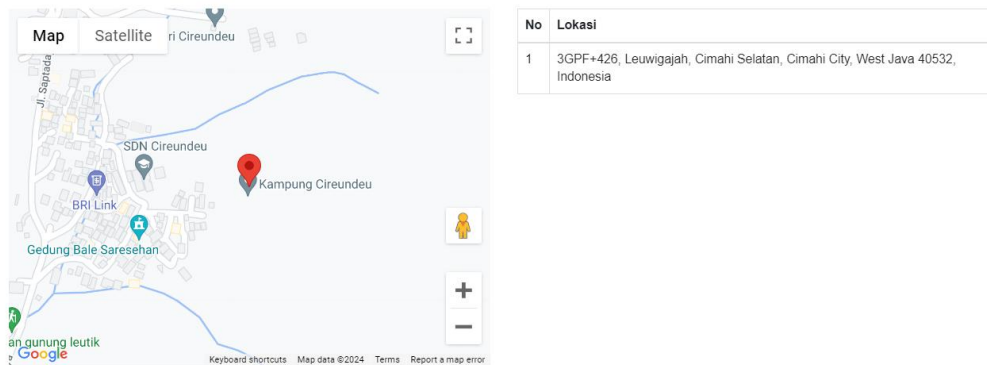


Figure 8. Detail position of the local wisdom can be found

The table in Figure 9 contains a link to show the student's report (*laporan*), photos in the local wisdom location (*galeri foto*), additional videos (*galeri video*), and other information.

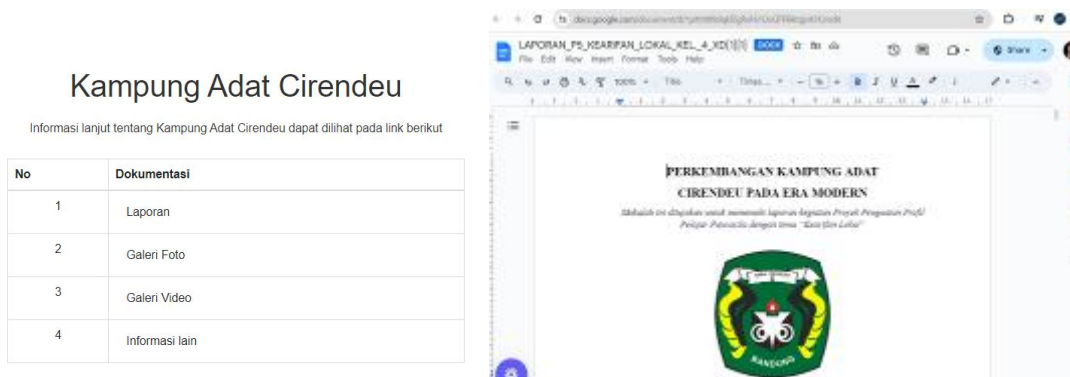


Figure 9. The next page show detailed information about the research report and a preview of the students' report

As contributors, users can register and fill in or update information about local wisdom, as shown in Figure 10. The local wisdom mapping application was also developed in mobile form. Still, the features in the mobile version are limited to viewing data only, and there are no features for entering or modifying data. Figure 11 shows the mobile version of the application in question.

#### 4. Discussion

The final stage is the socialization and evaluation of the application to all students. Socialization was done by involving students from two classes to enter data directly into the application. After the filling process is done together, an evaluation is conducted to see the user's response to the application. Figure 12 shows the atmosphere when the socialization took place. Based on interviews with several students and teachers/facilitators, the results showed that the majority of students and teachers thought that this application was very interesting, useful for helping document research results, and could be used as a source of information for implementing P5 with a similar theme for the following year.

**CultureMap** | Cantik Ceria Kontributor

Homepage | Contribution Data

### Edit Data Kebudayaan Nusantara

**Kategori Wilayah**: Nusantara

**Judul Kekayaan Budaya**: Candi Borobudur

**Kategori Budaya**: Bangunan

**Deskripsi Tentang Budaya**: Candi Borobudur adalah warisan peninggalan budaya masa lampau yang menunjukkan kemajuan budaya dan kemegahan blablablat

**Foto Budaya**: Choose File (No file chosen)

**Video Budaya**: <https://www.youtube.com/watch?v=u1yo-uJDSU4>

**Dokumentasi Laporan Budaya**: <https://drive.google.com/drive/folders/12Mu4PuJwKfI8cE4vCCz-Npd9bRuXaoD?usp=sharing>

**Galeri Foto**: <https://drive.google.com/drive/folders/12Mu4PuJwKfI8cE4vCCz-Npd9bRuXaoD?usp=sharing>

**Galeri Video**: <https://drive.google.com/drive/folders/12Mu4PuJwKfI8cE4vCCz-Npd9bRuXaoD?usp=sharing>

**Alamat Lengkap Budaya**: 96R3+VG4, Jl. East Side Pedestrian Walk, Kw. Candi Borobudur, Borobudur, Kec. Borobudur, Kabupaten Magelang, Jawa Tengah 56553

**Latitude**: -7.6075153147742

**Longitude**: 110.20372705849

Figure 10. Form for entering local wisdom information

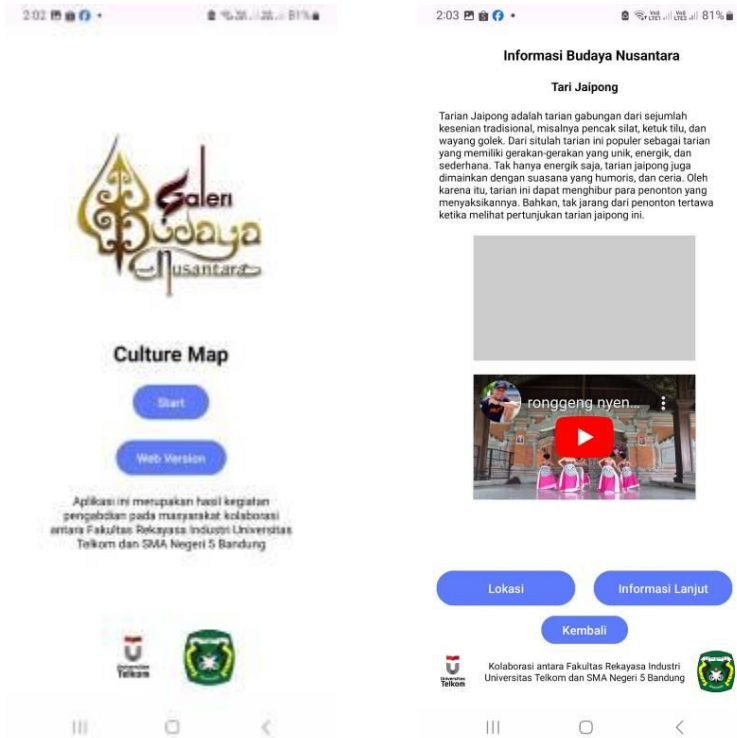


Figure 11. Mobile version of local wisdom mapping application



Figure 12. The atmosphere during socialization and application evaluation

We carry out the evaluation by assessing two aspects: the usability aspect, socialization activities, and perceptions of the overall benefits of the application. Usability evaluation was carried out with SUS, which used 10 questions based on Sauro and Lewis (Lewis & Sauro, 2017). SUS was chosen because this method is widely used to evaluate technology for education, such as campus websites, internet platforms, mobile applications, and multimedia (Vlachogianni & Tselios, 2022). We then convert the SUS evaluation results into grades A, B, C, and so on. Grade A scales between 100 and 84, Grade B scales between 80.8 and 84, Grade C scales between 78.9 and 80.7, and so on (Chan et al., 2022). The results of the recapitulation of SUS scores for 100 socialization participants showed an average score of 79.5, which shows that the usability level of the application is at grade B. Apart from the usability aspect, evaluation was also carried out on the delivery of material during socialization, which was adapted from end-of-course evaluation (Marcham et al., 2020), which includes three main statements and three additional questions from researchers to evaluate socialization activities and the benefits of the application for students and schools. Table 5 displays a summary of evaluations related to socialization activities and application benefits. In the table, it can be seen that the majority of students think that socialization activities are very interesting, and the application is considered very beneficial for students and the school.

Table 5. Evaluation of Socialization event

No	Statement	Respons <sup>*)</sup> (%)				
		SDA	DA	N	A	SA
1	The instructor really mastered the material presented.				20	80
2	The impression of the instructor was very positive.			5	49	46
3	The instructor provided sufficient opportunities for questions and answers.				20	80
4 **)	The socialization event is very interesting			2	41	57
5 **)	The application is very useful for the school				18	82
6 **)	The application is very useful for the students				20	80

\*) Percentage of students' chosen answers, which is SDA (Strongly Disagree), DA (Disagree), N (Neither agree or disagree), A(Agree), SA (Strongly agree).

\*\*) The researcher's statement aims to assess the socialization event and enhance its usefulness for students and schools.

## 5. Conclusion

In this research, a local wisdom mapping application has been successfully built, which aims to accommodate data from student research results during the implementation of P5 activities with the theme of local wisdom. The general public can access the web version of this application through the domain <https://indonesianculture.org/>. This application's main feature is a map that shows the locations of local wisdom, both in the Bandung City area, West Java, and throughout Indonesia. Apart from location, the application also provides complementary information such as related photos and videos, as well as complete student research reports. We introduced the application and assisted with data entry for two classes of 10th grade students at Negeri 5 Bandung. The results of the SUS evaluation show that the system has a high good level of usability, namely grade B, which means the application is simple to use and is considered to make it easier for users. Meanwhile, the evaluation of socialization activities and application benefits reveals that the majority of users find socialization activities to be highly engaging, and the mapping application proves to be highly beneficial for students, schools, and society as a whole. The next step is to share the app with other classes or schools to expand its data and increase students' and the community's knowledge regarding local wisdom.

The implementation of this research and community service was possible thanks to financial assistance from LPPM Telkom University and extraordinary cooperation from all levels of management, teachers, and students at SMA Negeri 5 Bandung.

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