Integrated Semantic Web Location Accuracy Development for Effective Data Management Facilities and Infrastructure

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Abstrak

This Community Service activity aims to develop a Semantic Web for the Petung Sewu tourist village. Petung Sewu Village is a village that has natural tourism objects and has the potential to be developed into sustainable tourism. The main problems in the Petung Sewu Assisted Village include: 1) The absence of an intelligent information system based on location accuracy that functions as data management for suggestions and infrastructure in the Petung Sewu tourist village as part of easy access to information on the available tourist attractions in Petung Village. Sewu; 2) The understanding and skills of the local community (Prospective Petung Sewu tourism managers) have not yet been formed in the application of science and technology, especially the use of the Semantic Web which can now easily show any information (Rest Areas, Hotspot Points, Toilets, Mosques and the urgency of other places).). Based on this problem, the PDM 2022 Proposed Team provides a solution to develop a Semantic Web of integrated location accuracy information that can be accessed in an Auto Responsive manner (from any media, PC, tablet or smartphone) to increase the effectiveness of information on the Petung Sewu Tourism Village. Implementation Methods Broadly speaking, there are 5 stages in the process of implementing the proposed PKM PDM activity method, namely starting from the stages of 1) preparation, 2) system development, 3) socialization, 4) evaluation, and 5) reporting. Semantic Web Development in Petung Sewu Village Using the ADDIE development method, including validation of feasibility, usability, SEO, and effectiveness of using the Semantic Web. The results of this service activity were Usabilty tests, SEO tests and Efectivity tests which produced valid results, this was obtained from the success rate of usability tests reaching 78%, SEO Testing 7%, and effectiveness tests of 89%, which on average the average results in 82.33% effectiveness in its application to the convenience of the Petungsewu tourism village..

Kata kunci*—Semantic Web, Location Accuracy, petungsewu*

1. INTRODUCTION

Indonesia is a country that prioritizes the tourism sector as foreign exchange, the optimization of the tourism sector is targeted by 27 million foreign tourists visiting Indonesia in 2019 (Kompas, 2019), but in 2020 Indonesia was faced with the Covid-19 pandemic which reduced the tourism sector. almost 70% in 2020, in 2021 the Indonesian tourism sector began to rise with an increase of 20% which is still relatively low, PPKM restrictions and regulation of foreign tourists coming to Indonesia made this condition continue to erode the Indonesian tourism sector. At the beginning of 2022, the policy was relaxed with strict provisions, so that many tourists who came to Indonesia, especially in Lombok, West Nusa Tenggara (CNN Indonesia, 2022) reported an increase of 45% in tourist visits with the Moto GP event located at the Circuit Mandalika Lombok. This is of course a breath of fresh air for the tourism sector in Indonesia.

The concept of sustainable tourism, which is currently being promoted, has also become a national strategic project, by suppressing the development of regional potential and being environmentally friendly.

To make Indonesia a world-class sustainable tourism destination, it must involve all parties, including tourists visiting the tourism sector. One of the drivers in realizing Indonesia as a sustainable tourism destination is by empowering local communities. This local community empowerment is one of the proposals in the development of tourist areas in Indonesia's potential areas. The concept of economic sector development that encapsulates the values of society to build a new paradigm in people-centered and people-participatory development. Efforts to empower the community (empowering people) can be studied from 3 (three) aspects: First, enabling, namely creating an atmosphere that allows the potential of the community to develop. Second, empowering, namely strengthening the potential of the community through concrete steps involving the provision of various inputs and opening up opportunities that will make the community more empowered. The third is protecting, namely protecting and defending the interests of the weak. These three aspects can be realized if there is intervention from the government and the community around the tourism sector.

The concept of Strengthening the Assisted Areas through the cooperation of potential village governments and universities, in this case the State University of Malang is one of the main targets to advance areas that have the potential to be developed into productive areas. Dr. Markus Diantoro, said that the target area was carried out to encourage each village to make superior thematic products according to the Government's instructions, namely One Product, One Village (Online, accessed February 16, 2022, http://lp2m.um.ac.id/).

Fig 1. MOU Signing

One of the tourism objects that is still natural and has the potential to be developed into sustainable tourism is the tourist area in Petungsewu Village. Petungsewu Village is located in Dau District, Malang Regency. To get to the location of Petungsewu Tourism Village, it can be reached through 2 main routes, namely the direction of Malang City (via Dieng) and Batu City (west route). In addition to its location at the foot of Mount Panderman, the publication and dissemination of information is also very lacking, so the area is still quiet. Petung Sewu Tourism Village is 14.4 Km from Malang State University, with a travel time of approximately 33 minutes making access and field studies easier and controlled, in the Petungsewu village area itself has quite a variety of tourism potential including Processed Citrus Fruits, Agro Markets, Campgrounds, tourist rest areas and various rides that are currently being developed. However, supporting facilities and information are still very minimal, such as toilets, parakeets, and community business stalls are still minimal, so it is necessary to develop cooperation with the State University of Malang.

2. METHOD

The method of activities carried out in this service activity is a description in the introduction and solutions to the problems that have been discussed, that the condition of the assisted villages needs to be improved, so several stages in this activity need to be implemented. Broadly speaking, there are 5 stages of the process method for implementing service activities, namely starting from stages 1) preparation, 2) system creation, 3) socialization, 4) evaluation, and 5) reporting. The flow of PKM activities is shown by the flow chart in Figure 2.

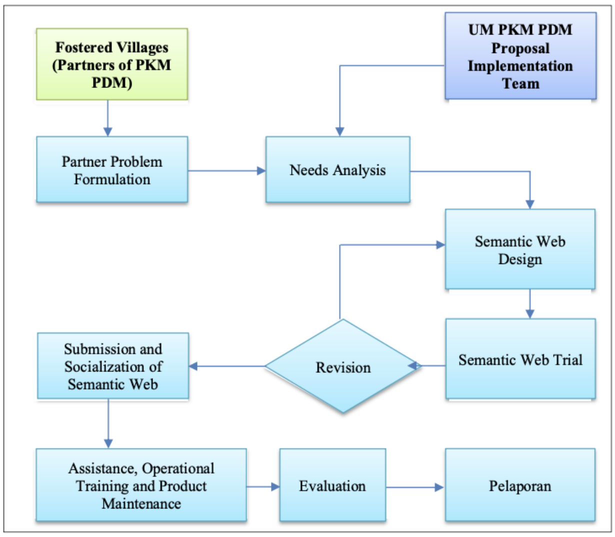

Fig 2. PKM Activity Implementation Flowchart

2.1. Preparation Stage (Problem Analysis and Needs Analysis)

The preparatory stage is carried out through 2 conditions, namely the formulation of the partner problem is carried out by field observations by meeting directly with the head of the village of Petung Sewu and then preparing an analysis of the needs of the assisted villages at the State University of Malang. At this stage, all needs are identified in the form of problems proposed by the assisted villages to design activities. All important information that is available will be recorded and used as material for consideration in implementing community activity programs. At this stage, partners have an important role in providing important information related to product development needs. After the coordination is complete, the PKM proposer can conduct a needs analysis and design tools or products related to Semantic Web Development for the assisted villages.

2.2. Semantic Web Development Stages

Semantic Web creation activities are carried out sequentially in stages, starting from planning to system revision. Each activity is carried out with an estimated implementation time of approximately 1-2 months. Each activity consists of several stages of system creation, namely (1) system design consisting of preparation, design, and purchase of materials, (2) system development, (3) system implementation and testing, and (4) system revision if necessary. . The stages of system design, development, and revision are carried out at the State University of Malang, while the stages of implementation and system testing are carried out at the location of the target village, in this case Petung Sewu village, Dau District, Malang Regency.

2.3 Product Usage Training Stages

The stages of training on the use of Semantic Web products are carried out after the service products can actually be implemented properly and correctly. This stage was carried out by the proposing team assisted by several undergraduate students of the Department of Electrical Engineering FT UM, while the object of this training was aimed at the community/ community/ manager/ management appointed from the related assisted villages as subjects who used it every day. At this stage, it begins with the delivery of products that are ready to be used to be installed in the target villages, then socialized and the last is training. The product submitted, socialized, and made as training material is a Semantic Web of integrated location accuracy information along with a Semantic Web usage manual.

2.4 Stages of Evaluation and Monitoring

The evaluation and monitoring stage here is the evaluation and monitoring of the results of product training in the form of the Semantic Web that has been applied in the target village area. The evaluation was carried out to review the success of the application of the Semantic Web in answering the problems of the assisted villages. Monitoring is the observation of the implementation of the Semantic Web by the assisted villages as a track record of the success of this PKM activity. The results of the evaluation and monitoring data will be very useful in the next stage. In addition, this evaluation and monitoring is also useful for the assisted villages in managing the management process and maintenance of the infrastructure and facilities inventory management information system.

2.5 Stages of Reporting PKM PDM Activities

The preparation of PKM PDM activity reports is carried out at this stage. The writing of the final report begins five months before the final deadline for planning PKM activities. The finalization of the PKM activity reporting takes an estimated time of implementation for approximately one month. The result is that the Implementing Team can complete the PKM report properly and on time along with the achievement of the promised outputs.

3. RESULT AND DISCUSSION

The result of this service activity is the development of the Semantic Web on the https://wisatapetungsewu.com/ website, the Semantic Web is an independent Web concept that can provide input automatically to users, the input is in the form of suggestions if the user enters the wrong name or sentence that is often searched for by the user. user, for example a user in the semantic web searches for the nearest toilet sentence, then the Semantic Web will automatically select the nearest toilet along with all information in Petung Sewu Village, this Semantic Web is also quite relevant because it is supported by Location Accuracy using GPS installed in Saran and infrastructure of Petung Sewu Village, the following is the hierarchy of the Semantic Web and its direct differences from the regular web in Figure 3. Shows the relevance of the application of the Semantic Web to the ontology of service activit

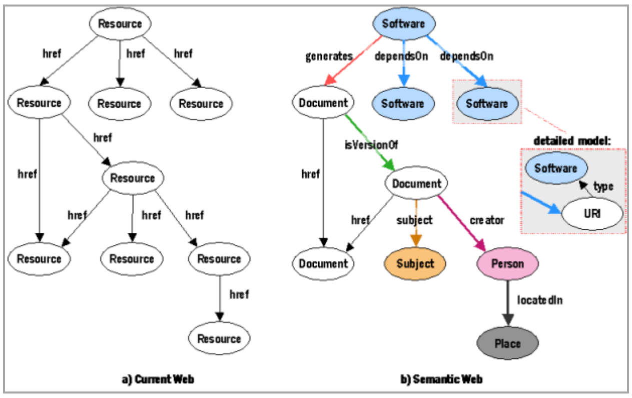

Fig 3 . Semantic Web implementation flow diagram

This Semantic Web development does not use a hierarchy or ontology of changes to system requirements, but rather provides intelligence and the ability to determine locations, suggest locations or even the cheapest places to eat near tourism, this of course will increase Petung Sewu Village tourism with technology that developed, the following are details of the minimum requirements for implementing Semantic Web products as follows in Table 1.

Table 1. System Requirements Specification

Type	No	Spesification
Software	1	Web Browser (Chrome, Mozila
	2	Firefox, Opera, Safari, dll)
	3	Flash Player Browser Plugin
	4	PDF Reader
	5	Microsoft Excel
		Image Viewer
Hardware	1	Personal Computer
		(Motherboard, CPU, VGA Card,
	2	LAN Card, HDD, Power Supply,
	3	USB slot, Monitor, Keyboard,
		dan Mouse).
		Smartphone Android/IOS
		Tablet PC
User	1	Administrator
	2	Partner Village
		Manager/Administration

These specifications are associated with the application of the semantic web as a whole in service activities, starting from UI design, functional menus and application of the breakdown menu to actualize the implementation of Location Accuracy in the tourist village of Petung Sewu. through any platform to make it easier for users to use the Semantic Web. The following is shown in Figure 4. It is a display of the Semantic Web embedded on the Petung Sewu website page.

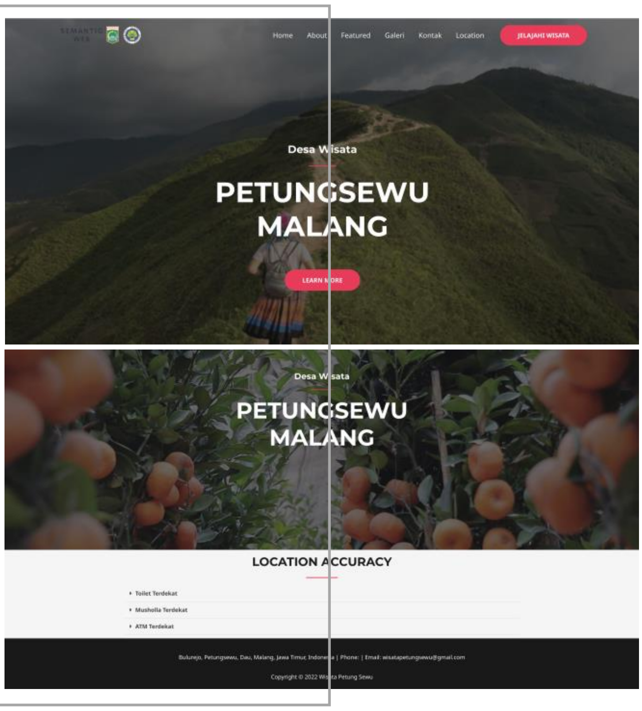

Fig 4. Semantic Web petungsewu Product

The results of the Usability test, SEO test and Efectivity test also produce valid results, this is obtained from the success rate of usability tests reaching 78%, SEO Testing 7%, and Efectivity drops of 89%, which on average produces 82, 33% effectiveness in its application to the convenience of the tourist village of Petungsewu. The following table 2 details the test results on the Semantic Web of the Petungsewu Tourism Village.

Table 2. Test Test on Semantic Application Web

Test	Number of Question	Result	Success (%)
Usability Test	12	Valid	78%
SEO	7	Valid	80%
Efectivity Test	15	Valid	89%

4. CONCLUSION

The development of an integrated Semantic Web Location Accuracy for the effectiveness of data management of facilities and infrastructure of the Petung Sewu tourist village has been proven to produce effectiveness and convenience for the wider community who will visit the Petungsewu tourist village, this is evidenced by the results of the Usabilty test, SEO test and the Effectiveness test. This is obtained from the success rate on usability drops reaching 78%, SEO Test at 7%, and effectiveness drops at 89%, which on average produces 82.33% effectiveness in its application to convenience in the tourist village of Petungsewu. In addition to this, the embedding of an auto responsive concept that can be accessed by various devices (starting from smartphones, PCs, tablets and GPS navigation) makes it easier for the community to access public facilities in the village of Petung Sewu, with this concept it is believed that people will be more comfortable and easy. to travel in the tourist village of Petungsewu, because it makes it easier for people to get reliable and accurate information.

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