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BLYNK-BASED REMOTE LIGHT CONTROL WORKSHOP FOR VOCATIONAL / HIGH SCHOOL STUDENTS IN PURWAKARTA

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Abstract.
Background. Community service activities, including a Blynk-Based Remote Light Control Workshop, were held on October 14, 2024, at the Indorama Engineering Polytechnic, Purwakarta. This activity is intended for SMK/SMA students in the Purwakarta area and aims to introduce Internet of Things (IoT) technology and its application in daily life.
Aim. In this workshop, participants were given an understanding of the basic concepts of IoT and trained to create a simple project, namely the remote control of lights using the Blynk application and the NodeMCU microcontroller.
Methods. The training sessions include introducing the Blynk app, user interface settings, and how to connect electronic devices to the internet network. This activity is carried out interactively, combining theory and hands-on practice.
Result. The activity results show that students can understand the basic concepts of IoT and successfully create a light control project independently. The high enthusiasm of the participants is an indicator of the workshop's success in increasing students' interest and skills in the field of IoT technology.
Implementation. This activity is expected to motivate students to continue to develop their technical skills and foster awareness of the importance of technological innovation in the digital era.

Keywords: Community service, Internet of Things (IoT), Blynk, remote light control, SMK/SMA students.

INTRODUCTION

Technological developments in this digital era have brought significant changes in various areas of life, including the Internet of Things (IoT) application. The concept of IoT Automation using this smart system can be remotely controlled, synchronized with a PC, laptop, or mobile phone, and accessed worldwide. An essential point of view of this model is that it reduces energy use and the cost of spare parts and guarantees well-being. IoT allows various electronic devices to be connected and controlled through the internet, making daily life easier with more sophisticated and automated systems. In education, especially at the vocational and high school levels, understanding the latest technology is very important to prepare students to face increasingly complex global challenges. (Sheth and Rupani 2019) (Crane *et al.*, 2018).

However, in various regions, including Purwakarta, students' introduction and understanding of IoT technology is minimal. Technology education provided in schools is often still theoretical and lacks opportunities for students to interact directly with the latest technology applications, such as IoT. Vocational and high school students who should be

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equipped with practical skills relevant to the times need more opportunities to develop their technical skills in modern technology.

Blynk is an Internet of Things platform that allows the most popular hardware platforms, such as Arduino, ESP8266, and others, to remotely control electronic devices through a dashboard that will enable users to create graphical interfaces with various widgets. Blynk also allows sensor data to be stored and displayed. Therefore, the workshop (Durani et al., 2018) (Hasan and Ismaeel 2020) "Blynk-Based Remote Control of Lights" was held as a form of community service to provide students with direct experience in learning and applying IoT technology. In this workshop, students were introduced to the Blynk app, which allows remote control of electronic devices using smartphones. This lamp control project was chosen because it is one of the simple yet applicative examples of IoT implementations that can be integrated into daily life.

Through this activity, it is hoped that SMK/SMA students in Purwakarta can gain new insights into IoT technology so that they are better prepared to face rapid technological developments and are motivated to explore the field of information and communication technology further. This activity is also in line with efforts to improve the quality of superior, creative, and innovative human resources, especially in technology and engineering. Objectives of community service activities: 1. Providing service in the form of workshops based on material related to IoT-based remote light control. 2. Develop participants' skills in planning, using, installing, changing, inspecting, and maintaining electrical equipment, installation, and equipment regularly and safely in the work environment.

METHOD

Troubleshooting Framework

IoT workshops require preparation by the service team. In this Community Service, Arduino ESP 8266 devices, Arduino, computer devices, and cables are used. The final goal of the service is that Purwakarta Vocational / High School students can program to wire 4 Control lights using Blynk

Goal

The target of this community service is Purwakarta Vocational School/High School.

Activity Method

Community service activities take the form of workshops or training on IoT. The material provided, namely theory and direct practicum by the trainees, is presented in modules.

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Blynk

Blynk is an Internet of Things (IoT) platform that allows users to control hardware over the Internet using a mobile application. It is designed to simplify creating IoT projects by providing an intuitive visual interface for monitoring and controlling devices in real time.(Sheth and Rupani 2019)

Wiring 4 Lights

IoT Wiring 4 IoT lights using ESP8266 is a low-power microcontroller equipped with a Wi-Fi module, which allows the device to connect to the internet network. Manufactured by Espressif Systems, ESP8266 is very popular among developers and enthusiasts of Internet of Things (IoT) projects due to its affordable price, small size, and ability to communicate wirelessly over the Wi-Fi protocol. (Feriyanti et al, 2022) and (Primary et al., 2023).

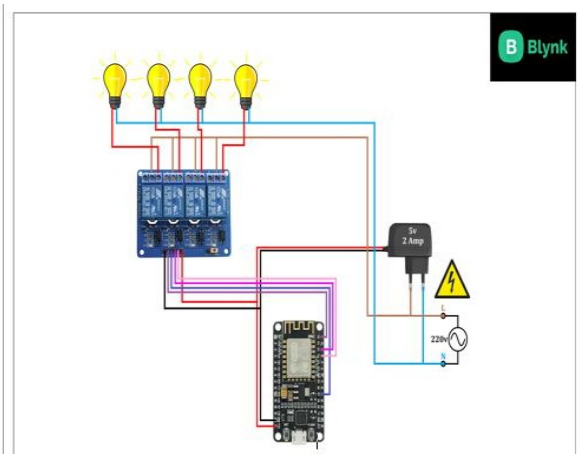

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Figure 1. *IoT Wiring* on 4 Lights

Cost Budget Draft

The *4-lamp Control Workshop* using IoT has the following cost budget design:

No	Information	Qty	Price Unit	Amount (Rp)
1	*2 x 1 meter* banner	1	IDR 40,000	IDR 40,000
2	Consumption:			
	a. Lunch	47	IDR 13,000	IDR 611,000

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	b. Snack Box (Cardboard + Cake)	42	IDR 4,800	IDR 201,600
	c. 200ml Air Mineral Cup	3	IDR 16,000	IDR 48,000
3	Best Participant Prize (E-wallet)			
	a. Top 1	1	IDR 50,000	IDR 50,000
	b. Top 2	1	IDR 30,000	IDR 30,000
	c. Best 3	1	IDR 20,000	IDR 20,000
Entire				IDR 1,000,600

The total cost of the Bylink IoT Workshop activities is IDR 1000,600 (one million six hundred rupiah).

DISCUSSION

Community service for Purwakarta Vocational School/High School students will be held on Thursday, October 10, 2024, at 08.00 until it is finished. The results obtained are as follows:

1. The activity was called "*Workshop* on Control of 4 Lights Using *Bylink* for students of SMKN 1 Sukatani, SMKN 1 Purwakarta and SMA in Purwakarta".
2. The activity was themed "Preparing for the Industrial Revolution 4.0".
3. The service was carried out in the Cubic class and Electrical Technology Workshop of the Indorama Engineering Polytechnic.
4. The participants of the 4 IoT lamp Control Workshop were 20 students and 1 teacher majoring in Electrical Engineering at SMK Negeri 1 Purwakarta, SMK Sukatani, and SMA Purwakarta.
5. Community service activities are in the form of *workshops* or training on IoT. The material provided was theory by Mr. Dani Usman and direct practicum by Trainee Lecturers, Staff and assisted by students presented in the form of modules.

The activity ran smoothly on Thursday, October 10, 2024, with the number of participants attending SMKN/SMA Purwakarta, 20 people, and one accompanying teacher. The event began with an opening, and then *the workshop* began with the provision of Introduction to IoT and Bylink *Programmer* material by Dani Usman, M.T, Practice Trainer Aziz Yulianto Pratama, M.T, Iwan Setiawan, S.Tr and Activity Coordinator Muhammad Arsya Nazwansyah and continued with a joint practicum on light control 4 with IoT using Bylink. Lecturers with Electrical Technology students carry out the trainees or workshop trainers. Students are divided

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into five groups, in 1 group consisting of 4 people so that in the practicum, they can go deeper and practice themselves (under supervision). Then it ended with the closing, certificate distribution, and group photo.

CONCLUSIONS

Conclusion

Based on the description of the implementation of community service activities above, conclusions can be drawn, including:

1. The community service successfully carried out activities in the form of *IoT workshops* in controlling 4 Lights using Bylink. The activity was held on Thursday, October 10, 2024, at 08.00 a.m. until it was finished at the Indorama Engineering Polytechnic.
2. Participants or partners are 20 Purwakarta Vocational School / High School students and one accompanying teacher. The workshop aims to improve skills in making Arduino programs, Bylink to wiring skills, and IoT device control configurations on 4 lights. Participants are active and suggest that this activity be carried out again regularly in the future.

Suggestions or Activity Evaluation

Suggestions or evaluations of these community service activities include:

1. IoT Training Evaluation: Participants are enthusiastic about trying BYLINK's IoT practicum continuously, so they are given additional time, which causes the event to be postponed slightly from what has been scheduled. In the future, there will be more improvements in the estimated time and activities that will be carried out.
2. It is hoped that IoT workshop service will be carried out regularly with more developed materials.

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