

Data Communication On Motorcycle Rental Based On Internet Of Things

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Abstract. Some things that are certainly considered in motorbike rental are that the service provider must record the identity of the tenant, see the location of the motorbike, and remind the tenant of the rental time. Tenant identity service providers still use manual methods that appear in data reports and service providers have not yet alerted the place of motorbikes and reminders of rental times. Tenant identity data collection, place point notifications, and rental time reminders can be done using the internet of things. This can make it easier for the provision of services to record the identity of the tenant, see the point of a place, and give an alert for the time of the rental, with motorbikes that are rented can be found out and equipped with a reminder of the time of the rental. The results show that the registration system and the system on motorbikes can communicate with each other, the registration system can record the tenant's identity in the form of a NIK well as an E- KTP ID become used as access to motorbike starting and the registration system can store tenant data. The data communication tool consists of two tools, the first registration system consists of keypad integration and the MFRC522 RFID module, the second system on motorbikes from the integration of the voltage sensor, neo m8n GPS, mq7 sensor, gasoline buoy, MFRC522 RFID module, speed sensor, and max6675 sensor and see the condition of the motorbike, the system on the motorbike can remind time of provision in the form of a voice indicator.

INTRODUCTION

Motorcycles are one of the vehicles that can be rented. In motorcycle rental service providers, service providers collect consumer or tenant identity data to handle the tenant's data, service providers generally collect data manually which is still vulnerable to loss of tenant data [1]. Not only is the data collection on the identity of the tenants done manually, but the service providers are also unable to find out the location of the motorbikes and the condition of other motorbikes being rented and there are often delays in returning the motorbikes that are rented [2].

The use of internet of things technology can facilitate communication between devices so that devices can exchange data with other devices [3]. Based on these problems, this study designed data communication on the internet of things-based motorcycle rentals. With this tool, it is possible to make it easier to record the identity of the tenant and find out the condition of the motorbike, including the location of the motorbike being rented and equipped with a sound indicator to remind the rental time.

MATERIALS AND METHODS

Materials

The materials needed in compiling the system so that the system works properly include Arduino mega 2650 mini, nodemcu, MFRC522 RFID module, GPS Neo M8n, monoxide gas sensor (MQ7), temperature sensor (MAX6675), voltage sensor, and hall effect sensor.

System Architecture

The system architecture as shown in Figure 1 has two parts in the architecture of this system, the first part of the registration system which acts as registration of E-KTP, seeing the identity of the tenant, and seeing the condition of the bicycle, the second is the part of the system on the motorcycle which serves to receive data from the registration system and sends sensor data installed on the motorcycle to the registration system.

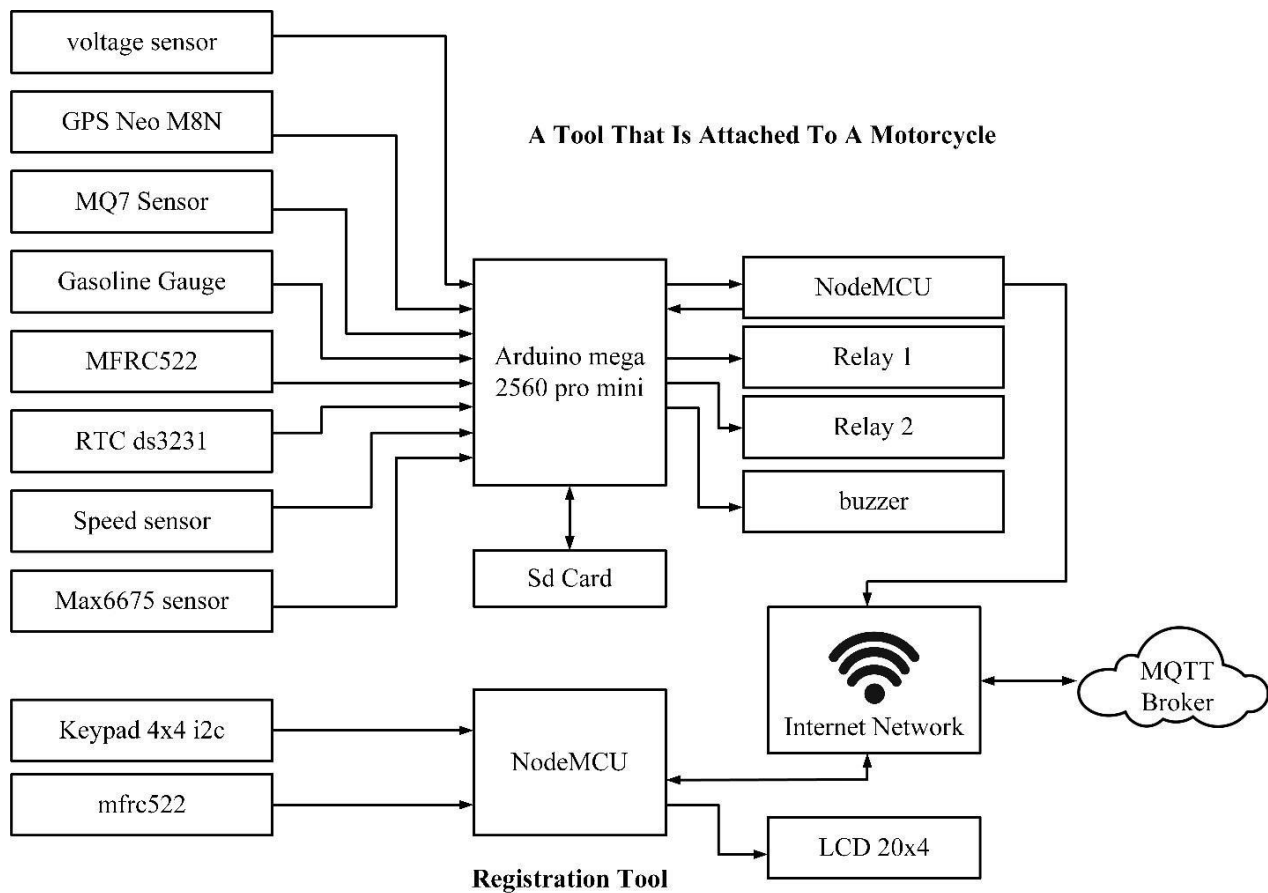


FIGURE 1. Sytem Architeure

System Flow

The system flow is divided into two parts, first the flowchart of the registration system that is made, starting from the system is off, when the system is turned on the system will work and will start connecting connections, if it is connected to the internet network, the system will retrieve data from MQTT and LCDs menu options. After that, the system will check what menu is selected, if menu A data-id E-KTP and rental time is sent to MQTT broker if menu B LCDs the identity of the tenant and if menu C LCDs the condition of the motorbike.

The two flowcharts of the system on the motorcycle are made, starting from the system is off, when the system is turned on, the microcontroller will turn on and the sensors will read and send the readings on the Arduino mega 2560pro mini and sent by the Arduino mega 2560 pro mini to the Arduino mega 2560 pro mini. node MCU, when node MCU is connected to the internet network, the sensor data is sent to the MQTT broker to be retrieved by the registration system and node MCU also retrieves the tenant id data and rental time at the MQTT broker which has been sent by the registration system, after node MCU has retrieved the id-data the E-KTP and rental time will then be forwarded to the Arduino mega 2560 pro mini to be stored on the sd card, after it is stored on the sd card, when the RFID reads the registered E-KTP then the motorbike can be turned on, and when the rental time has run out the buzzer will sound as a warning rental period has expired.

Wiring System

The design of this tool will be made modeling with the design of the tool. Figure 2 and Figure 3 will show a schematic of the hardware design of the Internet of Things-Based Data Communication Device for Motorcycle Rental, which aims to find out what components are needed in making the system.

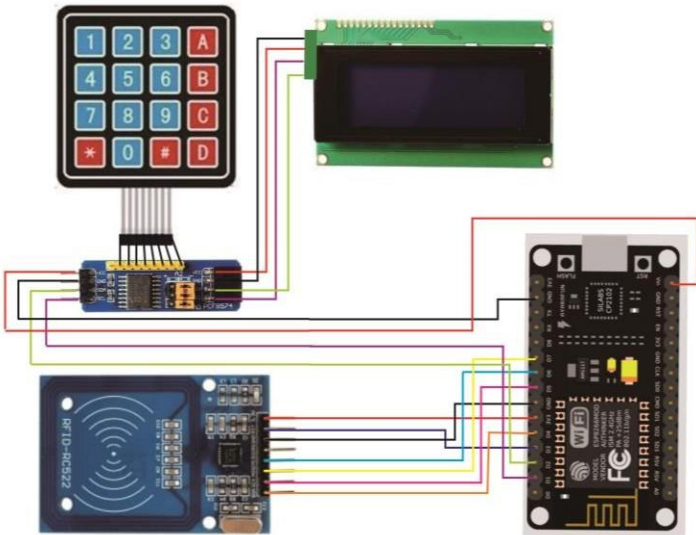


FIGURE 2. Schematic of Registration System Hardware Design

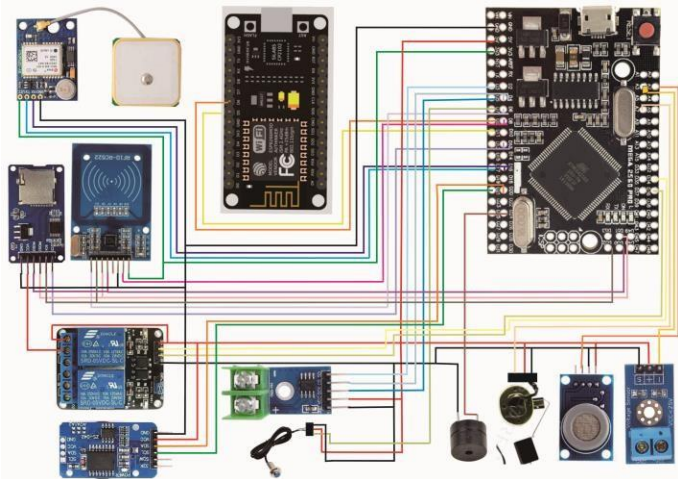


FIGURE 3. Motorcycle System Hardware Design Schematic

RESULTS AND DISCUSSION

Testing Motorcycle Address Input at Registration

Motorcycle address can be seen in Table 1

TABLE 1. Motorcycle Address Input Results on Registration

No	Address What is inputted	Registration System			Motorcycle System			Rental Time Out
		DataID E-KTP	Datadate, month, year	Data Time	Data Identity Tenant	Contact Motor cycleA1	Contact Motor cycleA2	
1		sent	sent	sent	Come on stage	Active	Not active	BuzzerSounds
2		sent	sent	sent	Come on stage	Active	Not active	BuzzerSounds
3	A1	sent	sent	sent	Come on stage	Active	Not active	BuzzerSounds
4		sent	sent	sent	Come on stage	Active	Not active	BuzzerSounds
5		sent	sent	sent	Come on stage	Active	Not active	BuzzerSounds
1		sent	sent	sent	Come on stage	Not active	Active	BuzzerSounds
2		sent	sent	sent	Come on stage	Not active	Active	BuzzerSounds
3	A2	sent	sent	sent	Come on stage	Not active	Active	BuzzerSounds
4		sent	sent	sent	Come on stage	Not active	Active	BuzzerSounds
5		sent	sent	sent	Come on stage	Not active	Active	BuzzerSounds
1		Not sent	Not sent	Not sent	Not showing	Not active	Not active	BuzzerSounds
2		Not sent	Not sent	Not sent	Not showing	Not active	Not active	BuzzerSounds
3	Besides A1 and A2	Not sent	Not sent	Not sent	Not showing	Not active	Not active	BuzzerSounds
4		Not sent	Not sent	Not sent	Not showing	Not active	Not active	BuzzerSounds
5		Not sent	Not sent	Not sent	Not showing	Not active	Not active	BuzzerSounds

After testing the motorcycle address input at registration with three motorcycle address inputs as in Table 1, the registration system only sends data on E-KTP, date, month, year, time on the MQTT broker when inputted addresses of available motorcycles and the motorcycle system can be accessed only with the E-KTP that has been registered in the registration system and the buzzer sounds when the rental time is up.

Testing On and Off System Conditions on Motorcycles

Result of testing can be seen in Table 2

TABLE 2. Testing the On and Off Conditions on the Motorcycle System on the Registration System

No	Motorcycle System Condition	Display of Motorcycle Conditions in the Registration System								
		Date, month, year	Time	Location	Temperature	Voltage	Co	Bbm	Speed	Mileage
1	On	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data
2		New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data

TABLE 2. Testing the On and Off Conditions on the Motorcycle System on the Registration System (Continue)

No	Motorcycle System Condition	Display of Motorcycle Conditions in the Registration System								
		Date, month, year	Time	Location	Temperature	Voltage	Co	Bbm	Speed	Mileage
3	On	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data
4		New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data
5		New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data	New Data
1		Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data
2		Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data
3	Off	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data
4		Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data
5		Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data	Latest Data

After Testing the On and Off Conditions on the Motorcycle System for the Registration System as shown in Table 2. The registration system will display the latest data sent by the motorcycle system on the condition of the motorcyclesystem On and the registration system will display the latest data received from the motorcycle system on the condition of the motorcycle system is Off.

CONCLUSION

Based on the results of research and discussion, it can be concluded that the Data Communication tool on InternetOf Things-Based Motorcycle Rental has succeeded in recording or recording the identity of the tenant in the form of a NIK which can be seen by inputting the address of the motorbike being rented in the registration system, the registration system can also see the condition motorbikes including the location of motorbikes for rent, the system installed on the motorbike can give a warning in the form of a buzzer sound when the rental time has finished.

This data communication tool on motorbike rental needs to be developed again in further research to get more optimal results with one of the developments in the registration system section so that it can record the name and address of the tenant in full and tenant data stored in the registration system can be stored permanently.

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