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# IOT Based Vehicle Larency Spotting

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**ABSTRACT:** The project aims to enhance vehicle security using Bluetooth technology integrated with Node MCU and GPS for real-time tracking and communication. Node MCU is utilized to obtain latitude and longitude coordinates from GPS and transmit this information to a designated server for remote monitoring. Arduino serves as the central processing unit, interfacing with components such as Bluetooth module, relay, motor, and buzzer to implement security features.

Bluetooth connectivity facilitates two-way communication, allowing users to input commands and receive alerts through a dedicated mobile application. An innovative feature includes the ability for the vehicle owner to trigger a buzzer alert and send a text message to the Bluetooth app upon reaching the vehicle's location, enhancing security and ensuring ease of locating the vehicle in crowded areas. Additionally, Bluetooth is employed to remotely start and stop the engine, enhancing convenience and control over vehicle operation.

Furthermore, the system incorporates an authorization mechanism where only the owner's specific card grants access to start the engine, adding an extra layer of security against unauthorized usage. The motor is utilized to symbolize the engine, and the relay is employed to control its operation, ensuring seamless integration with the vehicle's existing infrastructure. Overall, the project offers an advanced vehicle security solution leveraging Bluetooth technology for efficient communication and control, enhancing user convenience and peace of mind

## I. INTRODUCTION

The population of India according to 2018 census stands at 135.26 crores. The total number of registered vehicles in India stood at 30.92 million in the same year. In 2018 about 44,158 cases of vehicle theft was reported and only 19.6% of these cases could be solved. Every year the rate of vehicle theft increases by 10% to 12%. Rise in population is directly proportional to the rise in number of vehicles. With this, the risk of vehicle theft has also increased tremendously. Stolen vehicle does not only cause economic loss to the owner, it also may be used in certain criminal activities. This might put the owner of the vehicle in danger and unwelcome situations. Thus, having a functional and efficient anti-theft tracking and detecting system has become a necessity. This project "An IoT based vehicle theft detection and remote engine locking system" helps the user to track the location (with latitude and longitude) of vehicle at any given point of time with the help of an android app that will be installed in their phones. It makes use of GPS trackers that are installed in the vehicle to detect the location of the vehicle. Vehicle can be accessed either by ignition key or by the android application. Usually, user makes use of the android app to start, stop and lock the vehicle. Only if the mobile is not working or any other emergency, he makes use of the ignition key. When the user is using the ignition key, alert message will be sent to the user as well as the guardian as the vehicle is started using the ignition key. User has to inform prior to the guardian that, he is the one using the vehicle. Or else guardian will lock the engine using the android application. This system also includes a software that detects rash driving of the vehicle. Once this is detected the guardian will be alerted with a message about the same. With such effective systems we could control the theft of vehicle to a greater extent. People will have a way of stopping the crime from happening Instead of reporting the crime after it has already taken place, as the chances of solving such cases are really low at present time

**II. LITERATURE REVIEW**

PAPER TITLE	Smart Anti-Theft Vehicle Tracking System based on Internet of Things	Theft Detection and Controlling System of a Vehicle using GSM”	A smart Vehicle Tracking, Accident Detection, Alert Generation Using IoT	Design and Implementation of a Vehicle Theft Control Unit Using GSM and CAN technology”
METHODOLOGY	Switch is provided for turning on/off the fuel line of vehicles during any emergency. RFID used for authentication purpose and the Link It ONE development is used as the control board system for prototyping wearable and IoT device.	An anti-theft system used to cut-off the fuel supply for the engine from the Car burette a solenoid-valve, GSM system, buzzer & GPS system, OSIM 808 module, ATMega328 microcontroller are used in this system.	Alcohol sensor is used to check if the driver is drunk or not. To check the vibrations produced, vibration sensors are used. To detect speed breakers and potholes on the road, accelerometer is used	This System, deals with the design and development of theft control system by making use of embedded system, which is based on Global System for Mobile provisioning/ communication (GSM) Technology along with CAN bus technology and RFID system
IMPLEMENTATION	It is an Anti-theft vehicle tracking system based on IoT which only tracks the vehicles location (latitude and longitude). *It uses RFID based driver authentication system which provides an extra layer of security	*When the vehicle is stolen, an alert message is sent to the owner to trace the vehicle’s location. When the owner finds any threat, with the help of SMS he will cut the ignition of the spark plug with the help of relay.	To remove the unwanted sound and noise from the readings of the sensor, Signal Conditioning circuit is used. *Via Bluetooth, the hardware unit is connected to the mobile applications	*This system is reliable, when a cellular network is available *This system makes use of a mobile phone which is embedded in the vehicle with an interfacing Engine Control Module (ECM ) through control area network (CAN).

**III. PROBLEM STATEMENT**

Problem statement of this project is that, once the vehicle is being stolen, owner cannot track and lock their vehicle. The chances to get their vehicle back is very difficult. It makes so hard to track the vehicle when there is no evidence. So, this system will track and monitor the vehicle’s location using the android application and remotely locking the engine. Vehicle tracking system has been nominated as one of the best tracking systems for the losses of the vehicle. Generally, GPS tracking uses a system which is useful to find the actual location. So, by improving this system we make use of GPS and android based smart phones.

#### IV. EXISTING MODEL

The existing method of the project relies on traditional vehicle security systems that primarily utilize mechanical locks and keys for access control. These conventional systems often lack advanced features and are susceptible to vulnerabilities such as lock-picking and key duplication. Moreover, they do not provide real-time monitoring or remote access capabilities, limiting the owner's ability to track the vehicle's location or receive immediate alerts in case of unauthorized access or theft. Additionally, traditional security measures do not incorporate technologies like Bluetooth or GPS, which are essential for seamless communication and precise location tracking. As a result, vehicle owners are left with limited options for securing their vehicles and are unable to leverage the benefits of modern connectivity solutions for enhanced security and control.

##### Drawbacks:

1. Limited Security Features
2. Vulnerability to Theft
3. Lack of Real-Time Monitoring
4. Inability to Track Location Remotely
5. Absence of Advanced Connectivity Options

#### V. PROPOSED SYSTEM

The proposed method for enhancing vehicle security involves the integration of advanced technologies to overcome the limitations of the existing system. By incorporating Node MCU and GPS modules, the system enables real-time tracking of the vehicle's location. The Node MCU facilitates the transmission of latitude and longitude data to a centralized server, allowing owners to monitor their vehicles remotely via a web or mobile application. Additionally, Arduino is utilized to interface with components such as Bluetooth modules, relays, motors, and buzzers, enhancing the system's functionality.

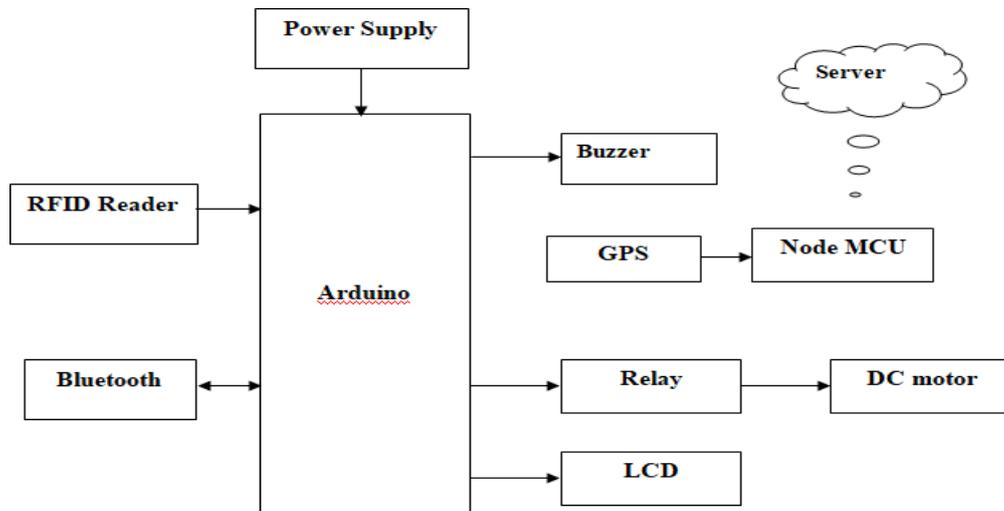
Furthermore, Bluetooth connectivity is leveraged for bidirectional communication, enabling users to send commands and receive alerts through their smartphones. A unique feature of the proposed system is the implementation of a specific card authorization mechanism, ensuring that only authorized individuals can start the vehicle's engine. Motor components represent the engine, and relays are employed to control its operation, providing an additional layer of security and control over the vehicle's functionality.

##### Advantages:

1. Real-time Tracking
2. Enhanced Remote Monitoring
3. Two-way Communication
4. Authorized Access Control
5. Improved Security Features

#### VI. METHODOLOGY

The methodology for enhancing vehicle security involves a comprehensive integration of Arduino, Bluetooth, RFID technology, and GPS components. Initially, the Node MCU is employed to acquire real-time latitude and longitude coordinates from the GPS module. This information is then transmitted to a designated server, enabling remote monitoring of the vehicle's location.



The Arduino, functioning as the central processing unit, interfaces with key components such as the Bluetooth module, relay, motor, and buzzer to implement a range of security features. The Bluetooth connectivity serves as a pivotal element in the two-way communication system, allowing users to seamlessly input commands and receive alerts through a dedicated mobile application.

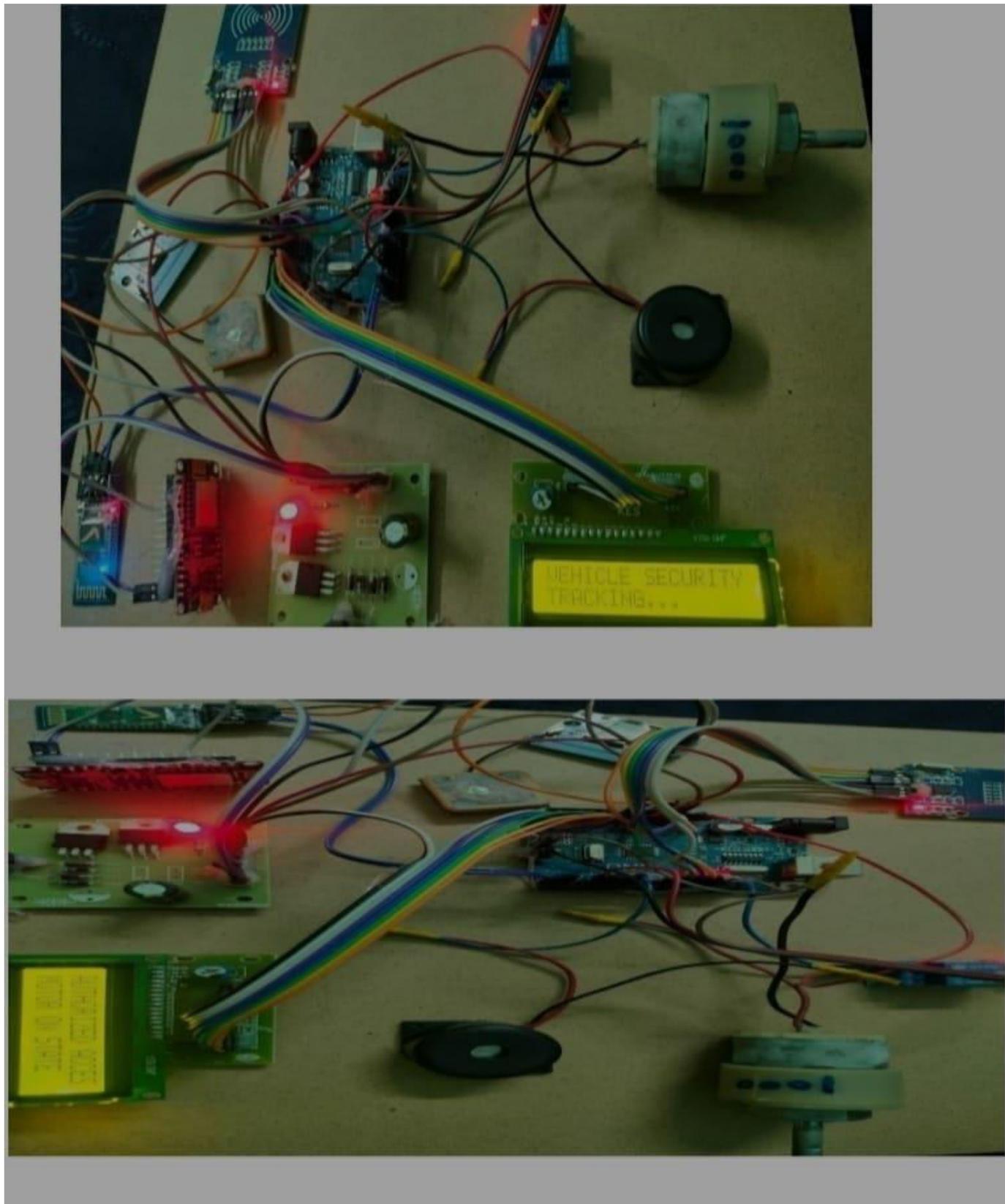
An innovative feature enables the vehicle owner to trigger a buzzer alert and send a text message via Bluetooth upon reaching the vehicle's location, significantly enhancing security and facilitating the location of the vehicle, especially in crowded areas. Additionally, Bluetooth is leveraged for remote engine start and stop, providing an unprecedented level of convenience and control over the vehicle's operation.

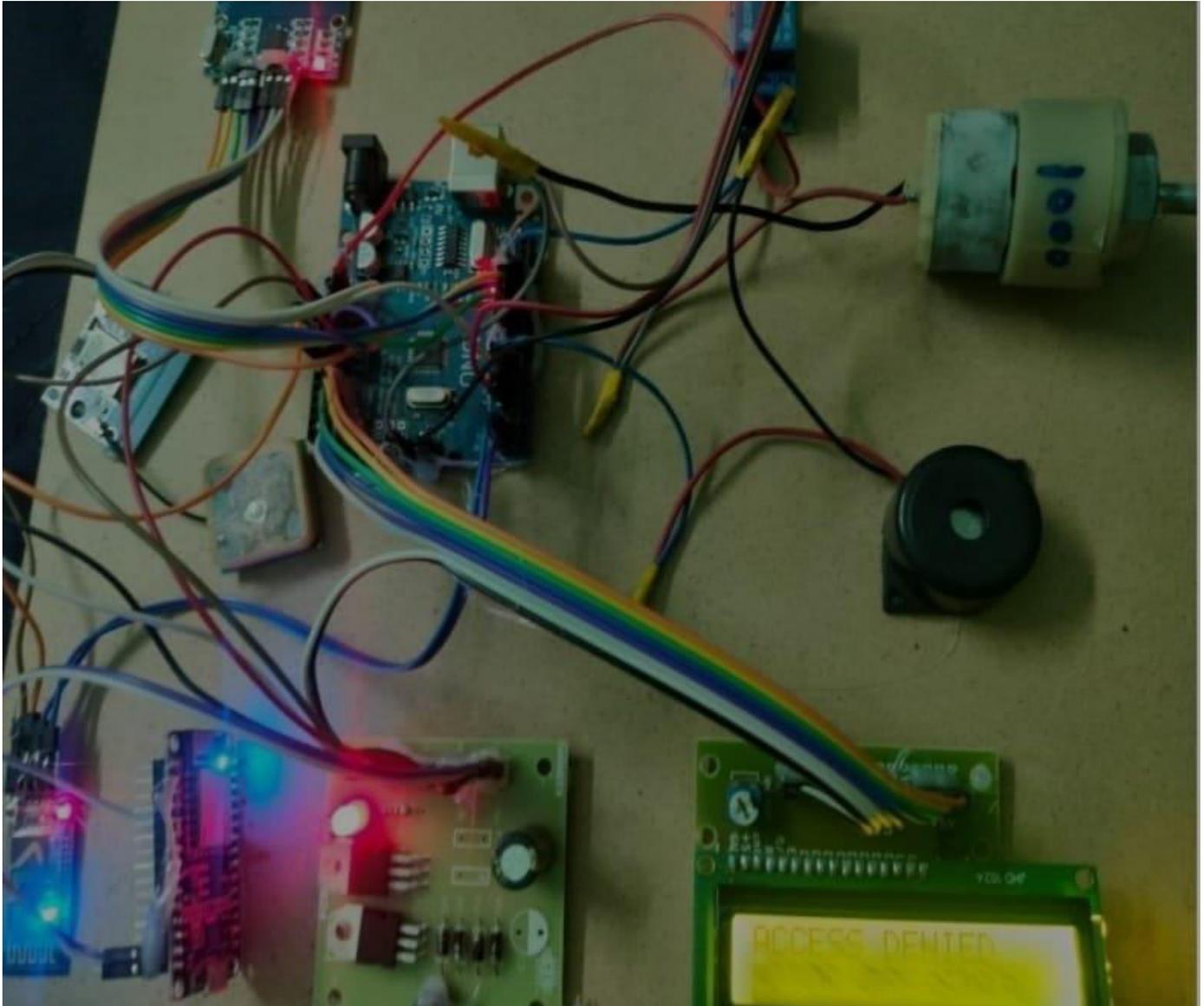
The security architecture is further fortified by an RFID authorization mechanism, where only the owner's specific card grants access to start the engine. This adds an extra layer of security, mitigating the risk of unauthorized vehicle usage. The symbolic representation of the engine using a motor controlled by a relay ensures seamless integration with the existing infrastructure of the vehicle.

Overall, this methodology creates an advanced vehicle security solution that harnesses the power of Bluetooth technology, offering efficient communication and control, thereby enhancing user convenience and instilling a sense of peace of mind.

## VII. RESULT

The project successfully delivers an advanced vehicle security solution by seamlessly integrating Bluetooth technology with Node MCU and GPS for real-time tracking and communication. Node MCU efficiently obtains latitude and longitude coordinates from GPS and transmits them to a designated server, enabling remote monitoring. Arduino acts as the central processing unit, coordinating with components like the Bluetooth module, relay, motor, and buzzer to implement robust security features. Bluetooth connectivity enables two-way communication, allowing users to input commands and receive alerts via a dedicated mobile application. A standout feature is the owner-triggered buzzer alert and text message capability upon reaching the vehicle's location, which significantly enhances security, especially in crowded areas. Moreover, Bluetooth facilitates remote engine start and stop functionality, providing users with unprecedented convenience and control over vehicle operation. The project's authorization mechanism, tied to the owner's specific card, adds an extra layer of security against unauthorized access, with the motor and relay ensuring seamless integration with the vehicle's infrastructure. Overall, this project not only leverages Bluetooth technology for efficient communication but also significantly enhances user convenience and peace of mind by offering a comprehensive and advanced vehicle security solution.





## VII. CONCLUSION

In conclusion, the development of the vehicle security system using Bluetooth and GPS technology represents a significant advancement in automotive security and management. By harnessing the power of these technologies, the project offers comprehensive solutions to address various challenges faced by vehicle owners and fleet managers. From enhancing security to improving operational efficiency, the system demonstrates its potential to revolutionize the way vehicles are monitored and managed.

One key takeaway from this project is the importance of leveraging modern technologies to mitigate security risks associated with vehicle theft and unauthorized access. By integrating Bluetooth communication for remote control and GPS tracking for real-time location monitoring, the system provides owners with greater control over their vehicles and enables swift response to security incidents. This proactive approach to vehicle security helps deter theft attempts and ensures prompt action in case of emergencies.

Furthermore, the project underscores the value of innovation in enhancing user experience and promoting safer driving practices. Through features such as remote engine control, anti-theft alerts, and driver monitoring, the system empowers users with valuable insights and tools to optimize vehicle usage and ensure the safety of both drivers and passengers. By incorporating feedback from users and continuously refining the system's capabilities, future iterations

of the project have the potential to further enhance vehicle security and management in an ever-evolving automotive landscape control over their vehicles and enables swift response to security incidents. This proactive approach to vehicle security helps deter theft attempts and ensures prompt action in case of emergencies.

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