# Design and Development of IOT base Agro-farm security system in Bangladesh

## Background:

Agricultural Farming is the largest and fastest growing economic sector in Bangladesh where more than 50% people are primarily interconnected with farm like Dairy farm, Poultry farm, Machinery Farm. And different sector in agricultural farming showed outstanding position in world economy. Farmer plays the vital role ensuring food security in Bangladesh. So, ensuring security to farmer's property, crop, animal, tool, machinery also is the priority. But in our country, farmers generally face problem of intruders attacking in their farm for stealing crops, cattle, machines, tools. It is not possible to giving guard every time for intruders as a barrier of such kind of activities. Thus, Farm security is the vital and alarming issue nowadays. The farm security method right now is unplanned and old-time consuming and as well as laborious. Ensuring the security of different types of farms, IoT is the new developed technology in every modern country in the world. But present scenario in our country, there's no well-planned modern security system as manually human guarding is used everywhere for security. Which is also costly. Those IOT based device initiated of giving such kind of help for farmers or farm owner to ease automation and user-friendly security system. This security system can ensure complete security of farming area from various kind of intruder. And this project proposed an IOT based security system to the perspective of our country to introduce the automation and modernize security in several types of farms shed in Bangladesh. Which will reduce human drudgery and ensuring low-cost complete security to farm. There will be no labor need for the security of famished. There are two types of security system used in this project. Laser and touch sensitive security system. When intruder close to the farm and touch the farm metallic boundary then alarming system notify and alert the owner with loud sound. If intruder anyhow enters the farm and pass the laser ray, alarming system will make superfluous sound and send a call-in farm owner. Intruder must pass the security system if he wants to steal anything. Without crossing the security system, one cannot close to the valuable things and steal those. It is indication and introducing of digitalization and automation of farm shed security in Bangladesh to ensure proper security without human drudgery.

## Objectives:

1. To design and develop a farm shed (dairy farm, poultry shed, and Machinery shed) security system
2. To install and test the security system

## Justification:

Nowadays, security is becoming a significant matter to all discipline of people in the world. So, as it is obvious necessary for the farmer also to secure his farm. But in our country, there's no step taken to secure the Agricultural farm. Robbery is becoming a big and uncontrollable issue in different types of Agro-based farm. We must consider our liability to criminal deeds such as robbery of farm equipment, heavy machinery, livestock animals, poultry, high value crops etc. The general aim of this study is to develop a smart farm security system using sensors. Specially, the study aims to:

1. Alert the farmer or owner with loud sound when violence activity is found
2. Call and SMS service to notify owner
3. Automation of security during nighttime

4. User friendly security system on and off
5. Test the accuracy and reliability of the system.

Security system with smart alarming mechanism in Bangladeshi farm is unusual and not practiced yet. Traditional human guarding is practiced all over the country. Except that the existing security system in our country for a particular place is only monitored by using a camera. Which is not always supervised all day long and not possible also. The smart solution of this problem can be solved by using smart sensor-based security mechanism as this project proposed earlier.

## Methodology:

This project works on introduction of smart IOT base security system in Bangladeshi Agricultural farm to ensure farm security from Rural area of Bangladesh to Urban area. This Security system developed based on 2 layers of security. And security mechanism is fully sensor based. By the measurement of change in surrounding in the presence of intruder or burglar alert system turns on to alert the owner or farmer. First level of security is ensured using vibration sensor in the entrance gate of the agro farm. When any intruder touches the boundary or door of the farm, vibration takes place and vibration sensor start its work. And alarm system turns on with the help of predefined program in the Arduino. Also, phone call is placed to farm owner to alert about intruder. Then if this security is failed somehow, second layer of security is ready to execute its work which is Laser base security alarm. And intruder must pass the laser light ray if he wants to steal anything from the farm. Which will interrupt the operation of laser sensor and alarm start making high volume of sound both in the farm and in farmer's house. And phone calling is also taken place. Thus, farm owner will be able to take necessary steps. And we used GSM module with Arduino to make phone call to the farmer's handset. Owner/farmer will be able to turn on or off the security system by making a simple call to the GSM module. And another feature of this system is the automation of turning on of security during nighttime. So, there's no need of worry about security if anyone forget to turn on the security during nighttime. And a real time precision clock is used to fix a time for regular basis automation of turning on the security at nighttime. And we have used battery base wireless system alarm to ensure security during load shedding period. This system is so user friendly that people of any type of educational background will be able to use the system without any training. With the help of a single mobile phone call to this module, security system turns on. And by making another phone call, security system turns off.

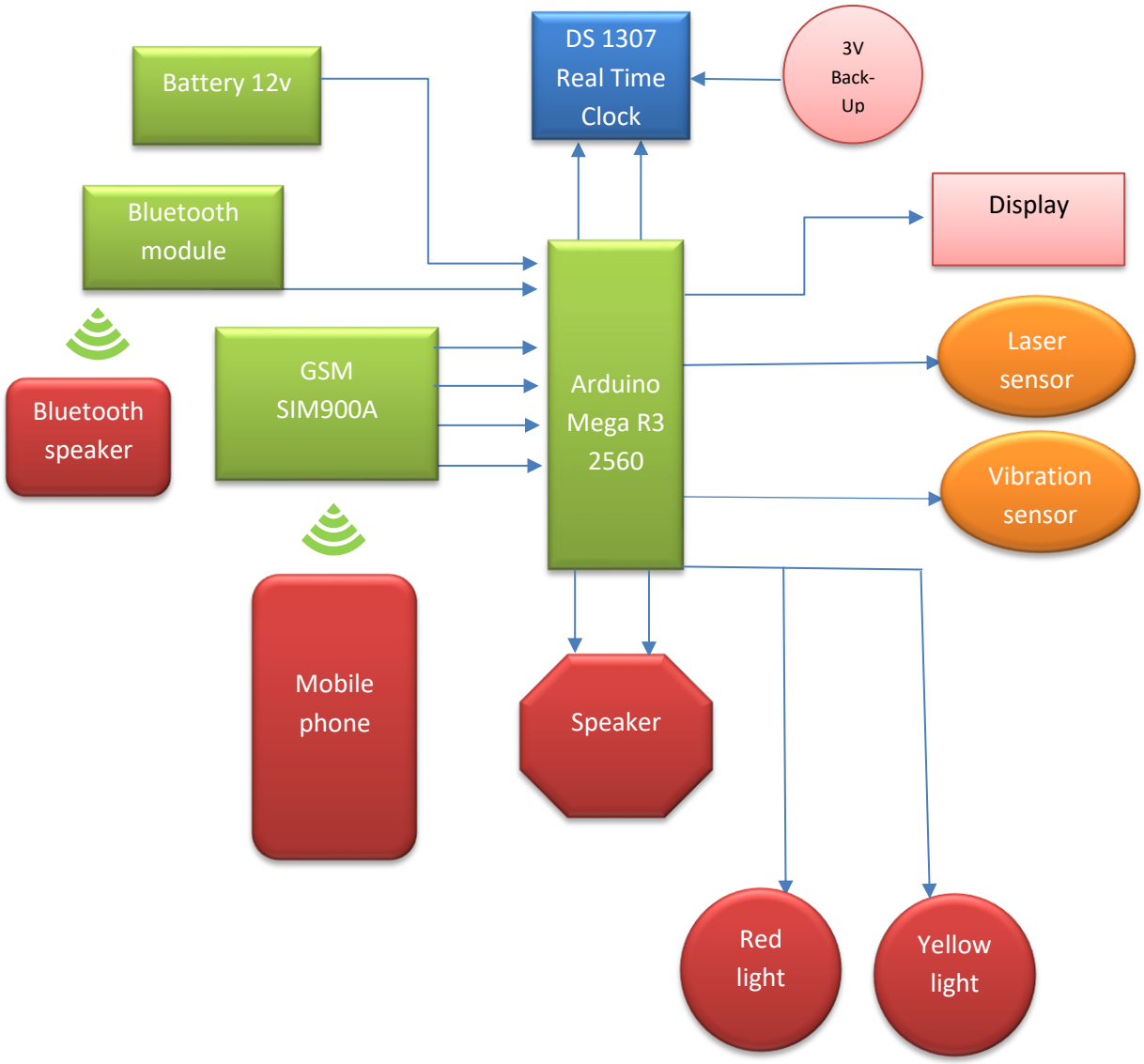


Fig: Circuit diagram

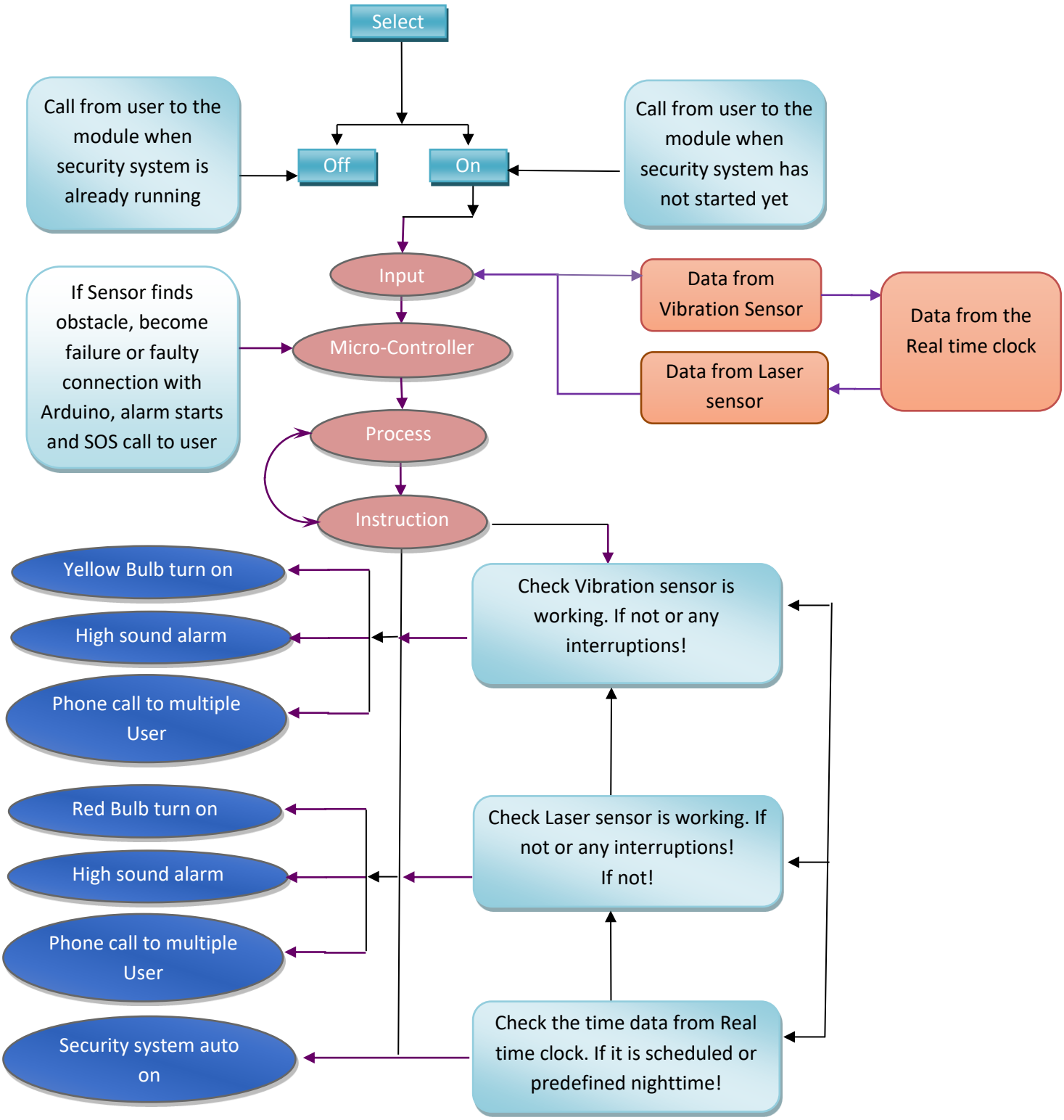


Fig: Block diagram

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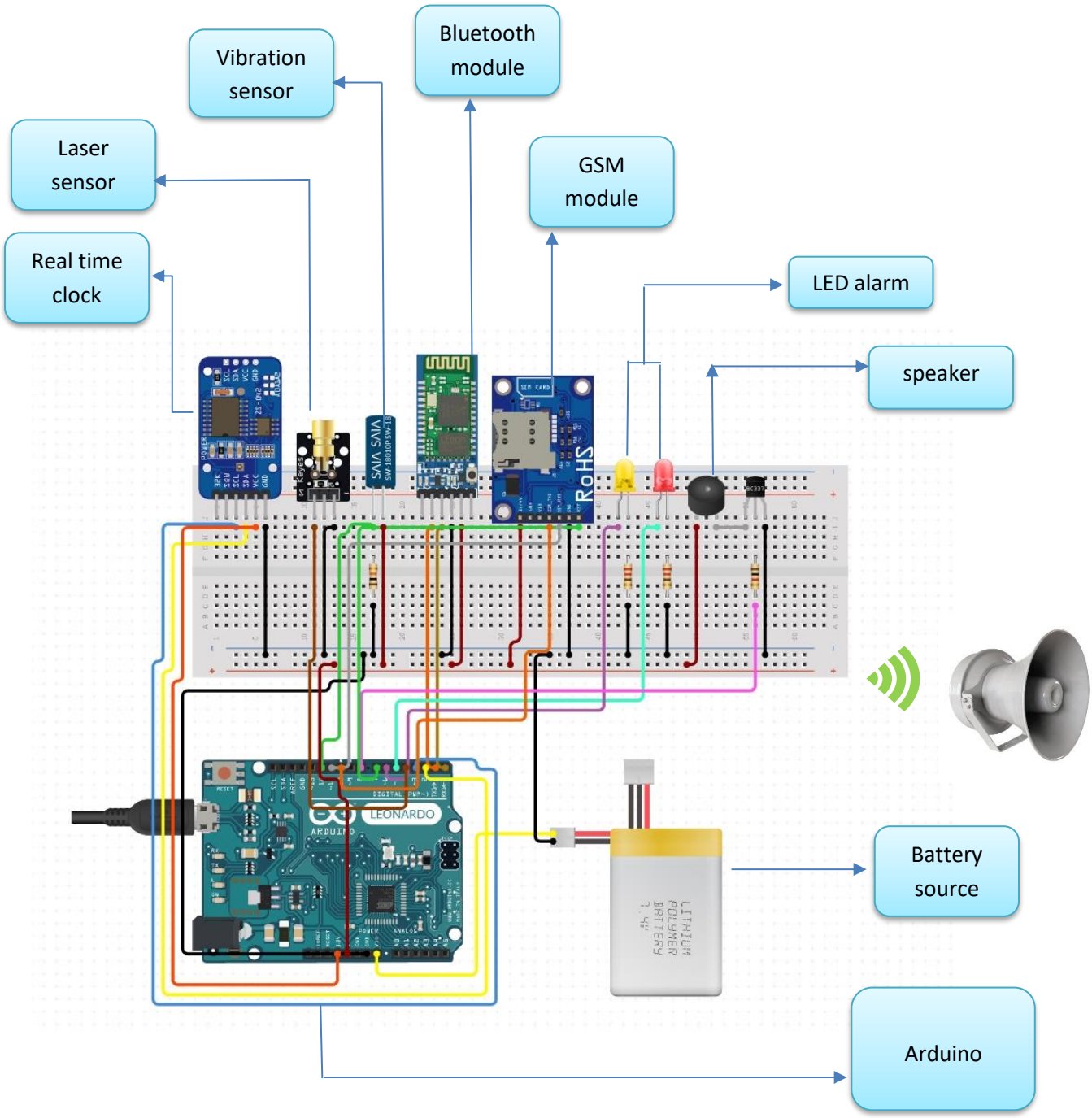

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Equipment list:

- ARDUINO MEGA
- PRECISION REAL TIME CLOCK MODULE DS3231 AT24C32 I2C
- GSM SIM900 ARDUINO SHIELD
- BLUETOOTH HC-12 Module
- 1.8" INCH TFT LCD DISPLAY MODULE ST7735S 128X160
- LDR SENSOR MODULE Receiver
- LASER SENSOR DIODE
- 12v DC battery
- Bluetooth alarm speaker
- 12V Loud Sound Siren Alarm
- Vibration sensor
- Breadboard
- Wire
- Alarm light
- Mirror
- Tripod stand (Manually made)
- Charger adapter
- Stand

Advantages:

- Labor cost for security will be reduced
- Complete security is ensured
- Auto security turns on during nighttime
- High sound alarm to alert surrounding area of farm
- Wireless alarm security ensured during loadshedding
- Call & SMS service to alert owner if he is outside of home
- Highly sensitive security is ensured
- 2 layers of security
- Security sensitivity can be regulated
- Can be on or off the security system easily by farmer people on phone call