IOT BASED ADVANCED SMART CRADLE FOR BABY MONITORING SYSTEM

AIM:

Design and Development of IOT based advanced smart cradle for baby monitoring system.

PURPOSE:

Baby care is important and it became care center business because of working women's busy life. There are many toys for engaging babies to spend their own time. But, cradle is more baby engaging device among all. There electrified cradles available but don't have additional features. To solve this, we proposed an IOT based advanced smart cradle with additional features like temperature, humidity, crying, and urine monitoring sensors. All sensors data monitoring through IOT cloud server. When baby moves then sensor will detect and switch ON fan to give comfort to baby. We want to implement all these features in single smart cradle.

DESCRIPTION:

IOT module (ESP8266) interfaced with Arduino UART port. DHT11, MIC sensor, MEMS sensor, Moisture sensor and servo motor interfaced with Arduino digital pins.

WORKING:

Arduino is main heart of this project and it will read all sensors and control cradle swinging. When Baby cries then MIC sensor identify and gives signal to Arduino. Arduino send PWM pulses to servo motor to swing cradle. MEMS sensors attached to baby to monitor moments of baby. When baby moves fan will be ON. If baby urinates then buzzer will be ON. Arduino reads all sensors data and displaying on LCD. Also, it sends sensors data to IOT cloud server through ESP8266. We can monitor baby conditions when baby is in cradle from remote server.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontroller	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16X2 LCD
Temperature Sensor	:	DHT11
Humidity Sensor	:	DHT11
Sound Sensor	:	MIC sensor
IOT Module	:	ESP8266
Wet Detection Sensor	:	Moisture sensor
Baby Moment Sensor	:	MEMS Sensor
Fan	:	12V DC Fan
DC Gear Motor	:	10 R.P.M
H-Bridge	:	L293D
Buzzer	:	5V DC
Power Source	:	12V 2 amp Adaptor

SOFTWARE:
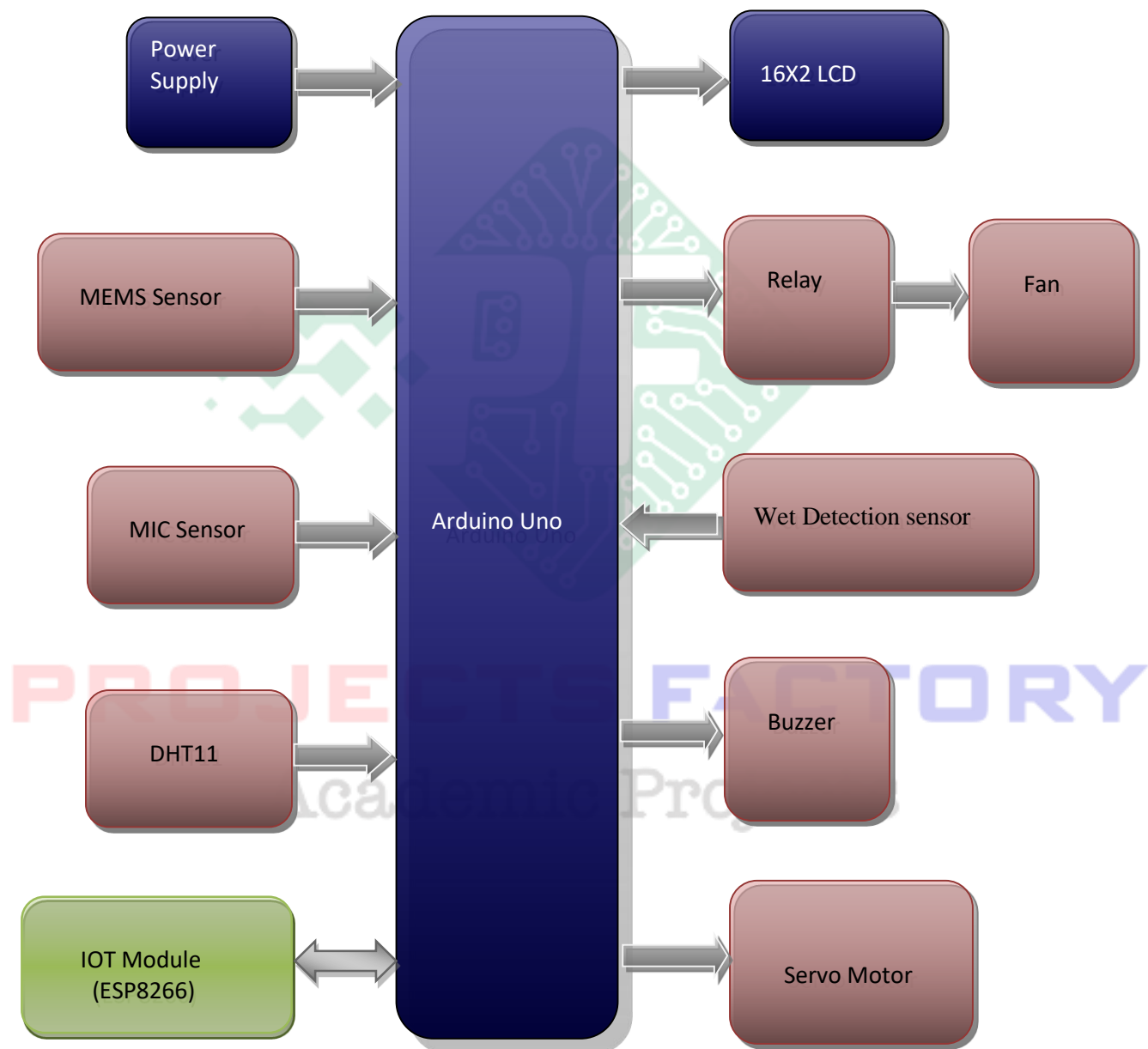
Arduino IDE

Proteus based circuit diagram

APPLICATIONS:

- ➢ IOT based cradle
- ➢ Electronic cradle
- ➢ Smart cradle
- ➢ Baby monitoring system

BLOCK DIAGRAM:

```
Power
Supply      ──►                    ──►   16X2 LCD

                    ┌──────────┐
MEMS Sensor ──►     │          │   ──►   Relay  ──►  Fan
                    │          │
                    │ Arduino  │
MIC Sensor  ──►     │   Uno    │   ◄──   Wet Detection sensor
                    │          │
                    │          │
DHT11       ──►     │          │   ──►   Buzzer
                    │          │
IOT Module          │          │
(ESP8266)   ◄──►    └──────────┘   ──►   Servo Motor
```

POWER SUPPLY BLOCKDIAGRAM:

Step down Transformer → Bridge Rectifier → Filter → Regulator → Output
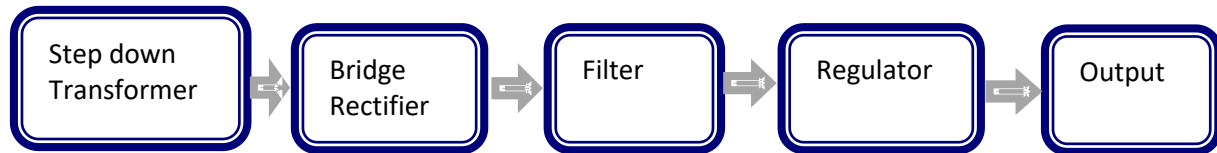
INTERFACES COVERD:

- We have covered Arduino and IOT (ESP8266) module interface.
- DHT11, MIC sensor (Sound sensor), wet detection sensor, MEMS sensor and DC gear motor interface.