Implementation of Dynamically Controlling Priority Load Management through IOT using Neural Network

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Abstract- Enormous innovation in the field Internet Of Things (IOT) has changed the manner in which we work and live. Brilliant applications has turned out to be more and progressively well known lately. It goes for helping individuals to deal with the different gadgets remotely. Anyway up as far as anyone is concerned no programmed procedure is accessible which powerfully control load. In this paper, we have proposed a fruitful execution of Internet of things (IOT) used for beneficial power usage and the game-plan of a self-decision control framework using Neural Network (NN). The NN is used to make convincing imperativeness stack plans. The condition of burden is constrained by microcontroller which depends upon consistent watching data through PC with the use of RF transreceiver module for correspondence .The server can control each and every one of the pile depend upon the relentless data from the sensors which are connected with the controller .The continuous data of the method is sent to the customer through IOT. .To avoid absence of force on the required burden the ANN Algorithm is executed in this system. An amusement show was created to examination the execution of our procedure to the extent upgrading essentialness efficiency and power usage.

Keyword- Electricity, IOT, Wi-Fi module, Neural Network.

I.   INTRODUCTION

Vitality In regular day to day existence the appetite after power is wrapping up observably more meanwhile the accessibility of intensity is less. Due to the headway of new advances in the field of gadgets has huge development. Different Load the executives methodology are used for vitality the board .Load the board is the route toward changing the supply of intensity on the framework with the electrical burden by adjusting or controlling the heap instead of the power station yield .New burden the executives advancements are ceaselessly being chipped away at both by private industry and open elements. Thus one of the innovations being created is need load the executives. A need load the board structure has been made remembering that the true objective to get a perfect vitality the executives over framework burden and battery stockpiling, and as such gives a superior administration effectiveness and confirmation the vitality supply for fundamental burden. In businesses there is

essentialness of vitality the executives. As a result of poor vitality the board in framework there is huge vitality misfortune happened. The RF handset is used to control and speak with the electrical plugs.This framework is involved Neural Network (NN) is used to organize the heap as indicated by power request .The ARM peruses the wattage of the circuit constantly. The NN can control all of the heaps hand-off on upon the consistent data from the appropriate sensors which are related with controller. To avoid the absence of vitality the NN Algorithm is executed in this framework.

II.   LITERATURE REVIEW

Eventually, there is a progression in the energy for power. The unit commitment and online dispatch are the fiscally sorting out issues .The proposed work edified the perfect estimation for burden shedding. The framework gives a quick figuring to stack shedding. In burden shedding procedure pull back the base possible burdens from framework and it diminish the manual exertion.TestsuyaKakkonda, Eiichi Tsukada. —"Electrical burden estimating by Neural Networks Considering Various Load Types" IEEE Intelligent framework ISAP 2003. In ANN the most unbelievable burden to each domain and the additional heap required to any zone are the wellsprings of data and effect made and control disasters are the yields . Back expansion Neural (BPN) Network figuring is proposed for the arranging particular warm power plants. ANN based Hydrothermal Scheduling was proposed by M.Suman, et.al. In our proposed work ANN is set up with different burden inquire. When it has been prepared it stays the ability to give stack planning graph for any regard for burden inquire. In this masterminding the total burden is shared to hydro and warm power stations as showed up by the cost of time Mohsen Hayati and YazdanShirvany . —"ANN approach for momentary burden determining for Illam locale" IJECSE vol.1 number 2, 2007 ISSN1307-5179. The ANN is used to make the essentialness valuable burden structures. The proposed structure depicts the home essentialness association framework will screen, supervise and control the use of home machines. This undertaking demonstrates the structure of a self-choice nuclear family control framework using Artificial Neural Network (ANN). The family control structure interfaces sensors and control loads with PIC controller. The server can control each store depend upon the anticipated data

from the monstrous sensors which are associated with controller. To stay away from the nonattendance of drive the ANN Algorithm is done in this structure. Md. Ashiquzzaman, NadiaAfroze, Taufiq Md. Abdullah(2012) In their proposed framework referenced the microcontroller based remote advanced meter which empowers the ongoing vitality utilization estimation, charging plan, comparing voltage, current , power factor and power utilization and gives the data about most extreme interest. In spite of the fact that the framework demonstrates to be easy to use just as effective there is no arrangement for programmed request control which will thus serves to give hardware's productivity.

III.   DESIGN METHODOLOGY

The framework utilizes AVR as a heart of the framework and WSN correspondence as a transmission and accepting vehicle for the information exchange and get. The power the executives need settings will be modified by ANN. Current transformer is venture up transformer given to detect the definite current streaming of the specific burden. Power transformer is venture down transformer used to gauge the voltage of specific burden. The current and voltage perusing is given to processor. Processor constantly peruses the intensity of each heap in the circuit. Transfer circuit is utilized to control the heaps. For shopper reason this data will be show on the LCD. RF Transceiver module is accommodated consistently transmitting and getting the information from the equipment to give information to MATLAB and the other way around. ANN is utilized to screen, oversee and control the heap the board utilizing MATLAB.

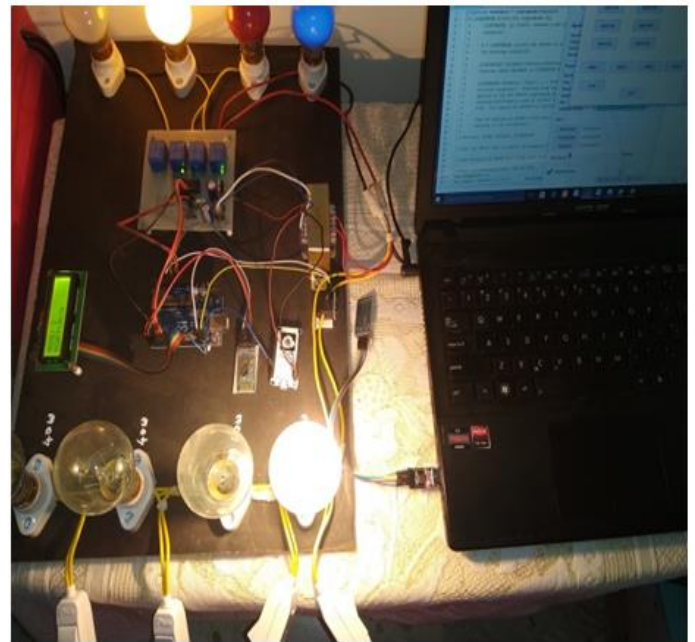Fig.1: Block Diagram Of System

Fig.2: Hardware Circuit Module

The calculation utilized is back spread neural system which is utilized to organize the heap. This can be actualized for both direct and non straight loads. In this framework there are two significant areas. One is equipment area and the following one is MATLAB .The two areas speak with one another through RF handsets .The LCD is associated with the PORT 0 and hand-off circuit is associated with PORT 1 of ATmega 328 AVR The CT is associated with AVR through ADC0.The power circuit supplies 230V to control transformer, current transformer and helper loads .Transformer changes over 230V into12V which is provided to entire circuit. All the while this power supply is given to the transfer driver circuit (ULN 2803) is utilized to change over the voltage of 5V to 12V to further drive the hand-off. A 3.3V supply is given to the AVR processor.

In execution we are sending the sign from the equipment utilizing RF handset as a Transmitter, In the Receiver part another RF handset module associated with the PC. The AVR peruses the equal burden current and burden voltage in the circuit. The data will be handled by the processor and it will ascertain the sum for that devoured power. For buyer reason this data will be show on the LCD. This wattage data is determined persistently by AVR processor. This determined esteem is send to the PC from the equipment area utilizing RF handset module at 2.4 GHz recurrence 9600 baud rate. This got estimation of wattage is given to ANN in MATLAB. Back proliferation arrange neural system is utilized for organizing load. This organize load in 4 modes as per their capacity wattage. Modes are portrayed by the table appeared as
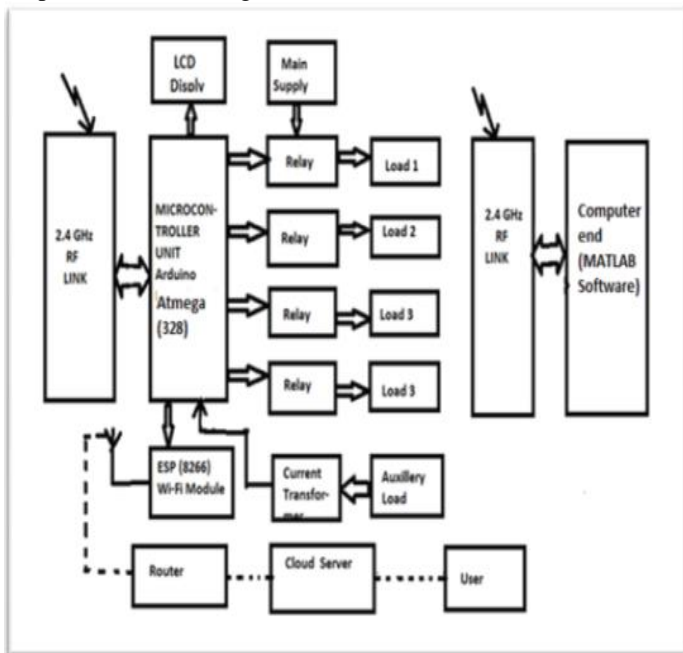
Table 1. Modes Characterized According To The Priority

INPUT WATT RANGE	MODE	OUTPUT
0≤W≤50	M1	L1 L3
50≤W≤100	M2	L2 L4
100≤W≤160	M3	L1 L4
160≤W≤200	M4	L2 L3

This fundamentally works in two modes. They are clarified as

1.Manual Mode: The client can turn ON or OFF the heaps without setting the greatest interest limit. The electrical parameters are being observed on constant premise and showed on the screen.

2. Automatic Mode : The heap need is set according to the client necessity and the most extreme interest cutoff is determined. When the time window is preset the framework will go into programmed method of activity on the off chance that the associated burdens are surpassing as far as possible, at that point the low and moderate need burden will be turned off keeping the most elevated need load ON. The heaps are reset once the time window has slipped by. As appeared in fig. 5, if there should be an occurrence of manual method of activity the framework works with no preset interest esteem and the heaps can be physically turned ON and OFF.

ANN peruses this esteem and organize the heap as per control prerequisite. In the Receiver part RF Transceiver is associated with the PC. In the wake of getting the sign from the server it sends to the sign to the AVR processor, in the wake of accepting the sign AVR sends a hinder to the associated transfers. Transfers are driven by hand-off driver IC 2803. As indicated by the need chosen by ANN, AVR intrudes on the Loads will works .Then the heaps jump ON/OFF through the heap the board framework. This constantly checked information is given to the customer through IOT .This sent data is utilized by customer to know the measure of intensity utilized by the associated burden at each time
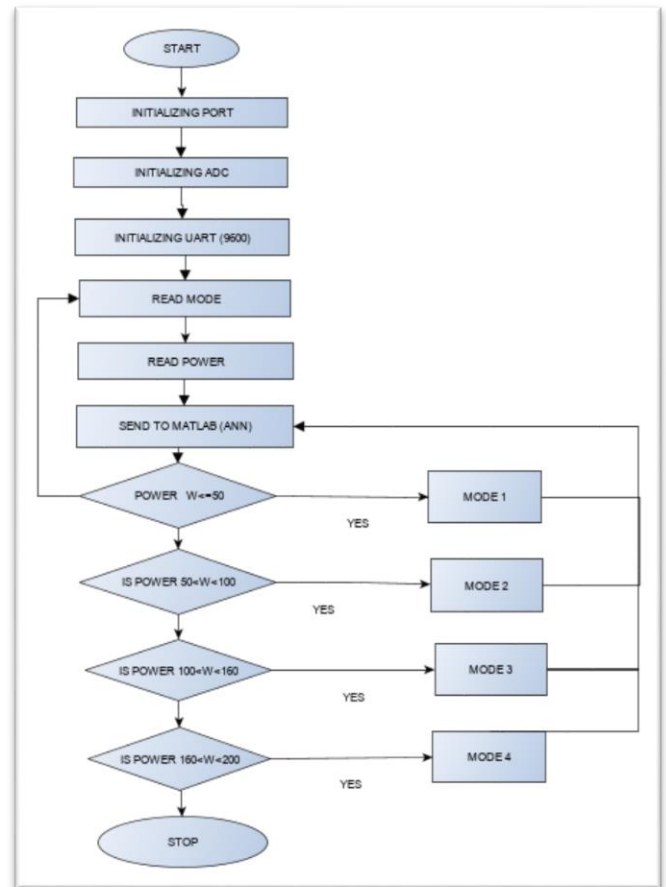
Flowchart Of System:-

Fig.3: Flowchart of Operating Principle

IV.   RESULT AND DISCUSSION

The equipment model of burden the executives framework is appeared in figure 4 .The heaps are interconnected .The LCD, RF transciever and current sensors are introduced the present sensors will constantly screens the associated burden and gives the heap current and burden voltage in the circuit to the ARM. The data will be handled by the processor and it will ascertain the sum for that expended power. For purchaser reason this data will be show on the LCD. This wattage data is determined persistently by AVR processor and is given to ANN. The Neural Network apparatus in Matlab programming is modified to be worked in the programmed mode. Underneath figures shows yield of working burden as indicated by the need set by ANN.

a.   Simulation Result
Fig.5 shows simulation result the load priority is set as per the user priority and the priority loads are specified.
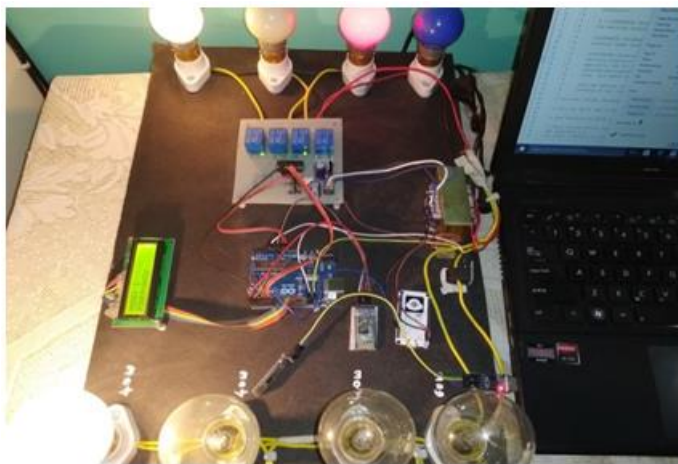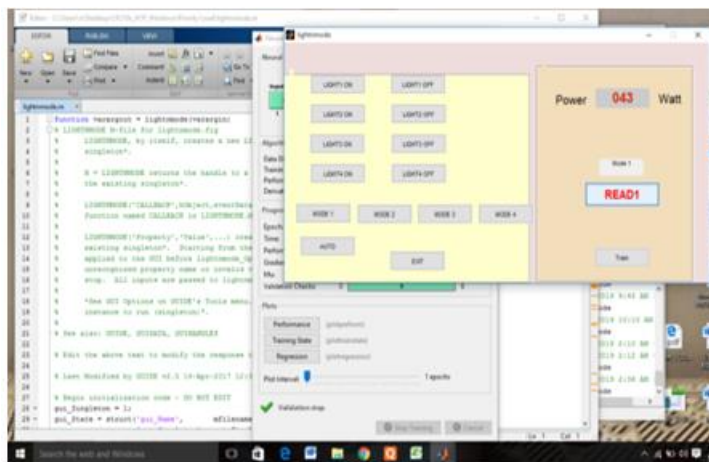
Fig.4: Mode 1 Output

Fig.5: Simulation Process of Output Mode 1

Once the Neural Network tool in MATLAB software is trained, then window manage the load by priority of consumer and calculated power also show on the screen. Above figs. shows hardware model of load management of all mode which are define, the below fig.5, which shows the simulation result of all mode, respectively.The continuously monitored data is forwarded to the client through IOT .This forwarded information is used by client to know the amount of power used by the connected load at each time provided to the client through thinger.io software which is an open source IOT platform for data collection, processing, visualization and device management.

b. Analysis Of An Implimentation

The simulation result revels that, in automatic mode of operation means the system basically operated with neural network tool that is it take its own decision to gives the priority to load for switch ON/OFF the load. Here, the power controlling priority setting will be programmed by Artifitial Neural Network. In manually mode of operation, the user can switch ON/OFF the load without neural network tool, here power controlling priority setting will not be programmed. Here we analysed priority load controlling on the basis of few parameter such as power consumption of user load and time period. The performance parameter for different priority mode shown in Table no.2

Table No. 2 Performance Parameter For Different Priority Mode

INPUT WATTAGE RANGE	MODE	OUTPUT	POWER CONSUMPTION (W)	TIME PERIOD (hh:mm:ss)
$0 \leq W \leq 50$	M1	L1 L3	40	23:56:43 AM
$50 \leq W \leq 100$	M2	L2 L4	20	23:56:45 AM
$100 \leq W \leq 160$	M3	L1 L4	30	23:56:50 AM
$160 \leq W \leq 200$	M4	L3 L4	30	23:56:54 AM
$200 \leq W \leq 240$	M4	L3 L4	30	23:56:56 AM
$50 \leq W \leq 100$	M2	L2 L4	20	23:57:05 AM

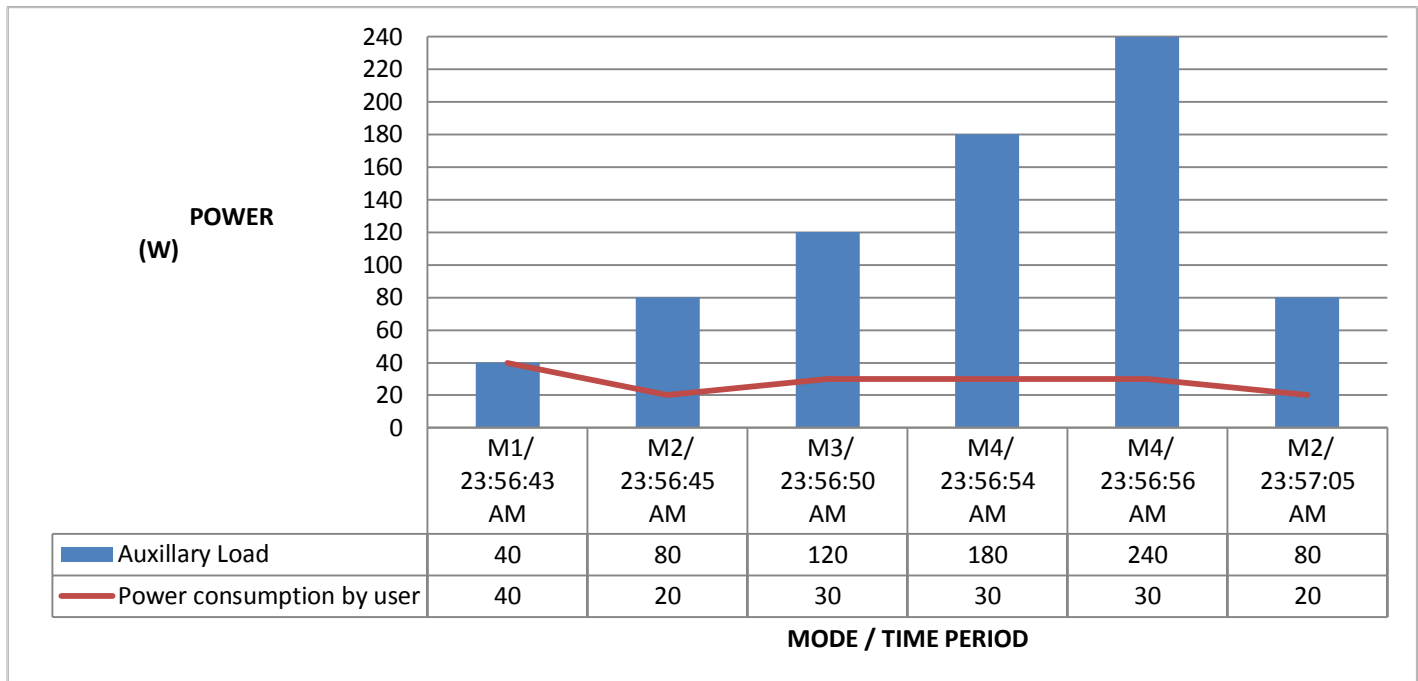| POWER (W)	M1/ 23:56:43 AM	M2/ 23:56:45 AM	M3/ 23:56:50 AM	M4/ 23:56:54 AM	M4/ 23:56:56 AM	M2/ 23:57:05 AM
Auxillary Load	40	80	120	180	240	80
Power consumption by user	40	20	30	30	30	20

MODE / TIME PERIOD

Fig.6: Graphical Representation Of Parameters of Different Mode

Concerning the need. Along these lines the power can be overseen in a productive manner. The constant information of the procedure is sent to the client through IOT innovation. This is executed in the venture which can be utilized in wide assortment of ongoing applications. Fig.6 demonstrates the Graphical portrayal of framework in programmed method of activity. The predefined mode reaches are fixed and all the associated burdens are set in the ideal need the different power esteems inside the ideal time length are plotted and the absolute power utilization for a specific period is as appeared in the figure above. For a pinnacle period time range the heap bend is level meaning that the less power utilization.

V. CONCLUSION

Power utilization is a basic need in the everyday life. The point of this venture was for the most part to empower the continuous checking of the related loads in perspective on the predefined greatest burden and to construct a heap at yield. In this framework, Arm will ceaselessly screen power supply in the circuit and show area is kept in the gadget in which shows power perusing. In the meantime ANN controls the heap as indicated by power necessity which will kill on or the heap as for the need. Accordingly the power can be overseen in a productive manner. The framework demonstrated to be helpful for both buyer and provider. The key usefulness will bolster critical pinnacle power moving and cutting and supply and over all proficient activity of framework. The ongoing information of the procedure is sent to the client through IOT

innovation. This is executed in the task which can be utilized in wide assortment of continuous applications

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