Smart Grid System to Monitor & Control Renewable Energy Source Based on WoT

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ABSTRACT

This article gives idea about grid ACTIVELY CALLED AS (SMART GRID) system of renewable energy source based on WoT which most effective the application of modern digital technology and information management practices and in core base modernization electrical delivery infrastructure. In this we studied of WOT introduction, System include used Rispberry pi 3 OS , Solar cell Voltage Current and Power, Easily use Software requirement and Rating This technology is an effective and increase the efficiency toward quality. Smart grid is increase participation globally towards customer to make them a co part of this system.

Keywords: *WoT, Installation of OS in Rispberry pi 3, V, I, P rating & Software Requirement for easy access.*

I. INTRODUCTION

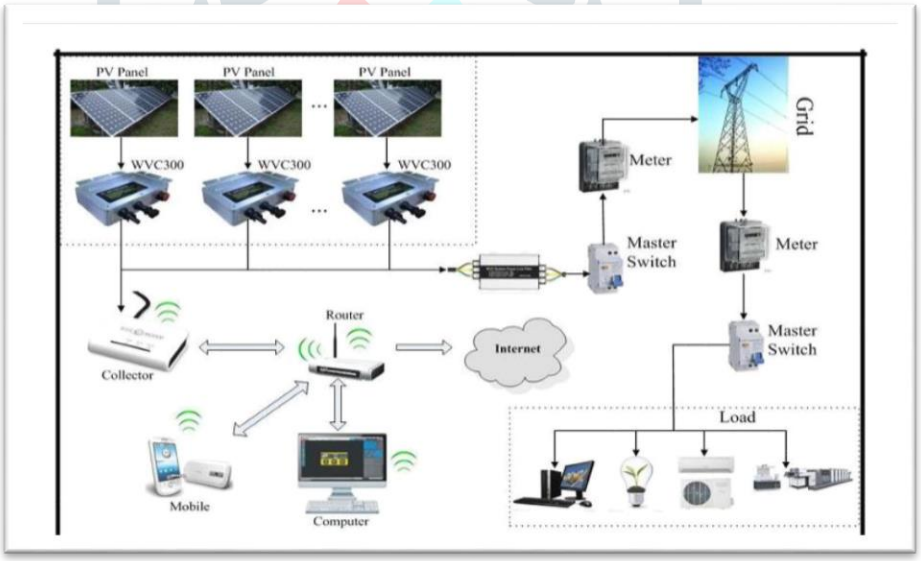

Figure 1 WoT Technology for Smart Home

Smart grid is a major one of step after power grid, which is extremely evaluated with today's modern advanced technology sensor measurement & Control parameter Information as per user demand and such technology, analysis of the decision-making, automatic control technology, and energy power technology. As improve quality of Service its Sensitivity. Therefore, smart grid has many characteristics including more safety, Utilization Energy, Intelligence.

Web of Things, namely "THE INTERNET IN WHICH THE THINGS CONNECTED TO EACH OTHER", is the extension and expansion of Internet-based network. According to the agreed protocols, with WOT key technologies: Where the communication information can be exchanged, and the intelligent recognition, positioning, tracking, monitoring and management can be achieved. W3C, WSN-WoT, Radio frequency identification technology, sensor technology, smart technology and nanotechnology.

II.RESEARCH METHODOLOGY Based On Various Guidelines

Introduction to Minitrack on AI, Machine Learning, and IOT & Analytics: The exponential growth of data-intensive technologies such as IoT, IoT, augmented reality, machine learning applications, and artificial intelligence is creating for the collection, organization, storage, and dissemination of knowledge. The implications of the impact these technologies have on the knowledge management ecosystem include process integration issues, data storage and data management challenges, behavioral issues such as trust in output from these technologies, and even challenges in the analytics process. Additionally, understanding the potential impact of these systems helps inform how to build and use the infrastructures and processes to achieve improved decision making and organizational performance.

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In this paper gives basics idea include use of Advanced Electronic gazettes e.g. Watch, Mobile etc. Which is a best example of gateways and sensor nodes in IoT applications, respectively. In conventional IoT systems, Easy hands on devices (Which used regular for Communication) which Collect and fed data to mobile gateways where most of computations are performed. However, the improvement of wearable devices, in several decade, has decreased the gap in terms of computation capability with mobile gateways. For this reason, some recent works present offloading schemes to utilize wearable devices and hence reducing the extreme load of mobile gateways for limited applications. In case, offloading methods on wearable devices has not been conducted.

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This paper describes a smart grid system of renewable energy source based on WoT. The smart grid involved the application of Advanced sensing technology and data management practices and is a core element in the ongoing upgrading modernization of the electricity delivery system. The renewable energy source has a photovoltaic cell. This system consist of three major subsystems namely power generation, storage, monitoring and billing by using WoT. WoT technology can effectively combine the infrastructure resources in increase the quality & efficiency of infrastructures in the existing power system. For better vision of a smart grid is its ability to enable informed participation by customers making them an integral part of the electrical power.

III. Installation of O.S. in Rispberry pi 3

Step I) Download **NOOBS** from website (https://www.raspberrypi.org) Beginners should start with NOOBS – New out Of the Box Software NOOBS. It's an easy **OS installer which contains Raspbian.** Best source of alternative operating systems .Which easily access from Internet Source (Best Raspbian OS)

Easy operating system installation manager is **New out Of Box Software** is an for the Raspberry Pi.Its form mainly two type offline and network install, or network install only.

NOOBS Lite or installing any other operating system requires an internet connection While Raspberry Pi OS in offline mode.

IV. Statically Analysis & Sample Description

(PV) cell requires 3 basic attributes:

- Electron-hole pairs or exactions.
- Separation of charge carriers (opposite types).
- To an external circuit ,Separate extraction of those carriers

In such a direct heating or indirect electrical power generation from heat. A (photo electrochemical), on the other hand, As relate to photovoltaic cell a device that splits water directly into hydrogen and oxygen using only solar illumination

Load (W)	Battery Back Up			Solar Plate		
	BATTERY HOURS	VOLTAGE (V)	CURRENT (I)	VOLTAGE (V)	CURRENT (I)	POWER (P)
100	10	12	83.3	12	12	144
200	10	12	166.6	12	23.85	286
250	10	12	208.3	12	30	360
300	10	12	250	12	36	432
500	10	12	417	12	60	720
750	10	12	625	12	89.2	1071.4
900	10	12	750	12	107.14	1178.5
1000	10	12	833.3	12	119	1428

Table 1 Display of Battery Backup and Solar Plate for various loads

Simple Problem / Condition statement Sample Numerical: We have to provide a power to 50W load having **Load back up time of 10 Hr** and we have i /p Voltage (Battery): 12V

*Battery Backup (BB) = Output Load*Load Backup
= 50*10=500
I= 500/12=42A (We need a battery 12 V 42 A)

*To Calculate Solar Plate design:
Current of System=42A

Battery charging Hour: 7Hr (time during which sunrays will presents)
*To find current of Solar Plate 6A
Power=Current*Voltage=12*6
72 W, 12 V, 6A (Easily Calculate System Specification)

V .Software required

1. For Rispberry pi: rispberian O.S.
2. For Circuit Designing: Proteus 8.0
3. For PCB Layout: Protal 99 SE.
4. For web page : HTML and PHP(programming language)

Introduction to HTML (Hypertext Markup Language)

HTML is the standard markup language for creating Web pages.HTML (Hypertext Markup Language) is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page.

(Display an internet browsing page in words and images for the user). Markup code is referred to as an element (but MOST people also refer to it as a tag).

HTML is also use to interpret and compose text, images, and other material into visual or audible web pages. For enhanced by the web page designer's additional use of CSS. As well in case of CTSS these formatting commands used by typesetters to manually format documents.

- Its (HTML) stands for Hyper Text Markup Language
- Its describes the structure of Web pages using markup
- Its elements are represented by tags
- Its tags label pieces of content such as "heading", "paragraph", "table", likewise.
- Browsers do not display the HTML tags,
- Its render the content of the Page

HTML Tags and its Description

Tag	Description
<html>	For an HTML document
<body>	For document's body
<h1> to <h6>	For header 1 to header 6
<p>	For a paragraph
 	Inserts a single line break
<hr>	For a horizontal rule
<!-->	For a comment

Table 2 : Basic HTML tag

VI . PHP

(PHP) is a programming language Where user to create an extreme dynamic content's that interacts with databases. These is used to developing web based software applications.

It's one of small open source project.

- PHP: Hypertext Preprocessor.
- PHP is a server station side scripting language that is used to manage content, databases, session tracking, even build entire e-commerce sites.
- Mainly in integrate databases MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server.
- As in case of an Apache module on the UNIX side. The MySQL server, once started, executes crucial queries with huge result sets in record-setting time.

- PHP supports major protocols like POP3, IMAP, and LDAP. PHP4 added support for Java and distributed object architectures like COM and CORBA making n-tier development a possibility for the first time.
- PHP C-Like Syntax.

VII. Controlling Test Result on Web Page

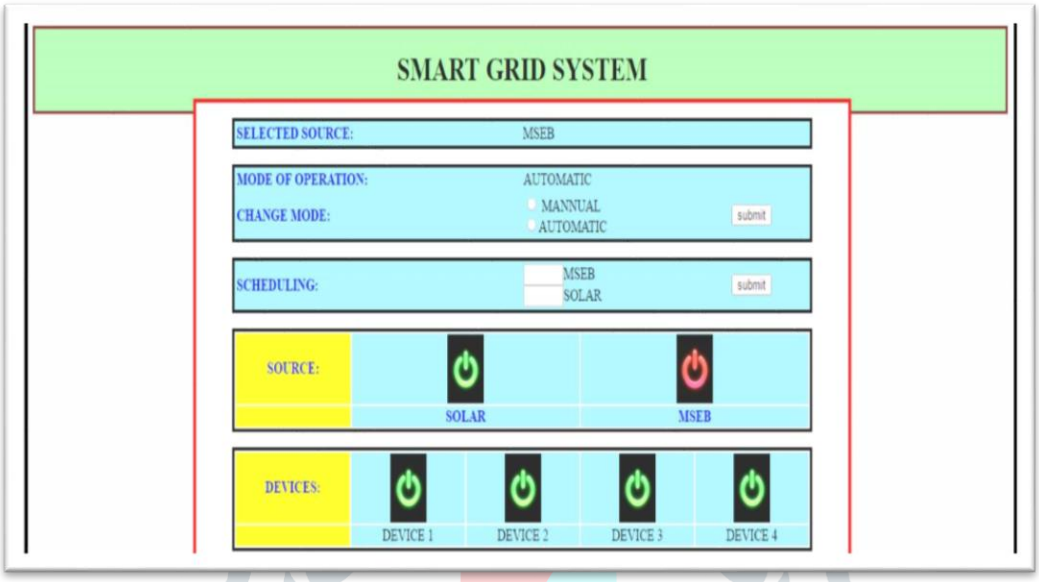

Figure 2 Screen shot of Web page

The controlling of devices / switches is done only through web page. The screen shot of window is shown in figure .Here, we provided a various rows for controlling purpose. The readings from system are continuously updates on web page after each 15 seconds. We can easily access selected source, selected source, Load Status, Billing, Name and address of customer etc.

IX.Conclusion

In these proposed Smart Grid System to monitor and Control Renewable Energy Sources Based on Web of Things gives basic idea and use of Rispberry Pi 3 .These system more efficient and flexible for Smart Home and industrial application, where we learn specification include I, V, P as well used of Software for switching of this load in automatic and manual way. The automatic way is run based on scheduling.

The user interaction function with proposed system has been carried out by using WoT technology. The system effectively work with source and real time. It's helping to improve quality and to increase the performance of system along with effective use of renewable energy source.

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