



**Department of Electrical and Computer Engineering
North South University**

Senior Design Project

Iot Based Smart Energy Consumption System

Tahsin Chowdhury Iqra ID# 2022272643

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Faculty Advisor:

Dr. Nafisa Noor

Assistant Professor

ECE Department

Summer, 2023

LETTER OF TRANSMITTAL

November, 2023

To

Dr. Rajesh Palit

Chairman,

Department of Electrical and Computer Engineering

North South University, Dhaka

Subject: **Submission of Capstone Project Report on “Smart energy meter using IOT”**

Dear Sir,

With due respect, we would like to submit our **Capstone Project Report** on “**Iot Based Smart Energy Consumption System**” as a part of our BSc program. The report deals with Multi-level Based Home energy measuring System. This project was beneficial to us in gaining experience in the practical field and applying it in real life. We tried to the maximum competence to meet all the dimensions required from this report.

We will be highly obliged if you kindly receive this report and provide your valuable judgment. It would be our immense pleasure if you find this report helpful and informative to have an apparent perspective.

Sincerely Yours,

.....

Tahsin Chowdhury Iqra

ECE Department

North South University, Bangladesh

.....
Afzal Hossain
ECE Department
North South University, Bangladesh

.....
Zihad Hasan
ECE Department
North South University, Bangladesh

APPROVAL

Afzal Hossain (ID# 1731277043), Tahsin Chowdhury Niloy (ID# 2022272643), and Zihad hasan (ID# 2022007643) from the Electrical and Computer Engineering Department of North South University have worked on the Senior Design Project titled “Iot Based Smart Energy Consumption System” under the supervision of Dr. Nafisa Noor partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

Supervisor’s Signature

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Dr. Nafisa Noor

Assistant Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

Chairman’s Signature

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Dr. Rajesh Palit

Professor

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

DECLARATION

It is to declare that this project is our original work. No part of this work has been submitted elsewhere, partially or entirely, for the award of any other degree or diploma. All project-related information will remain confidential and shall not be disclosed without the formal consent of the project supervisor. Relevant previous works presented in this report have been adequately acknowledged and cited. The plagiarism policy, as stated by the supervisor, has been maintained.

Students' names & Signatures

1. Tahsin Chowdhury Iqra

2. Afzal Hossain

3. Zihad hasan

ACKNOWLEDGEMENTS

The authors would like to express their heartfelt gratitude towards their project and research supervisor, Dr. Nafisa Noor, Assistant Professor, Department of Electrical and Computer Engineering, North South University, Bangladesh, for his invaluable support, precise guidance, and advice on the experiments, research, and theoretical studies carried out during the course of the current project and also in the preparation of the report.

Furthermore, the authors would like to thank the Department of Electrical and Computer Engineering, North South University, Bangladesh, for facilitating the research. The authors would also like to thank their loved ones for their countless sacrifices and continual support.

ABSTRACT

Iot Based Smart Energy Consumption System

Electricity plays a vital role in day to day life. Rapid growth in global energy consumption has increased the need for efficient and sustainable energy management solutions. In response to this challenge, this project paper presents a novel approach to energy monitoring and management through the development of "Smart Energy Meters" using IOT. The main goal of this project is to create and implement an advanced energy meter that can monitor energy use in real-time and offer features like load control, automated billing, and remote monitoring. To accomplish these, the meter combines both software and hardware components.

Microcontrollers, communication interfaces, and sensor modules make up the hardware component. These sensors are in charge of precisely monitoring voltage, current, and electricity usage in real time. Microcontrollers manage communication with the central system and other devices in addition to processing the gathered data. The communication interface makes it easier to transport data to a local server or the cloud. It is typically based on wireless technologies like Wi-Fi.

Additionally, smart energy meters can help utility companies optimize energy delivery by providing accurate information on energy demand, identifying unusual consumption patterns, and enabling demand-response strategies. It has the potential to reduce energy losses, lower operational costs and reduce the environmental impact of energy production and distribution.

To sum up, this project paper introduces a Smart Energy Meter using IoT technology as a significant step towards creating an efficient and sustainable energy ecosystem. The system is a useful tool for improving energy efficiency and lowering energy waste since it can offer real-time data, raise customer awareness, and allow remote control of electrical devices. We can get closer to a more intelligent and environmentally friendly energy future by incorporating IoT into energy management.