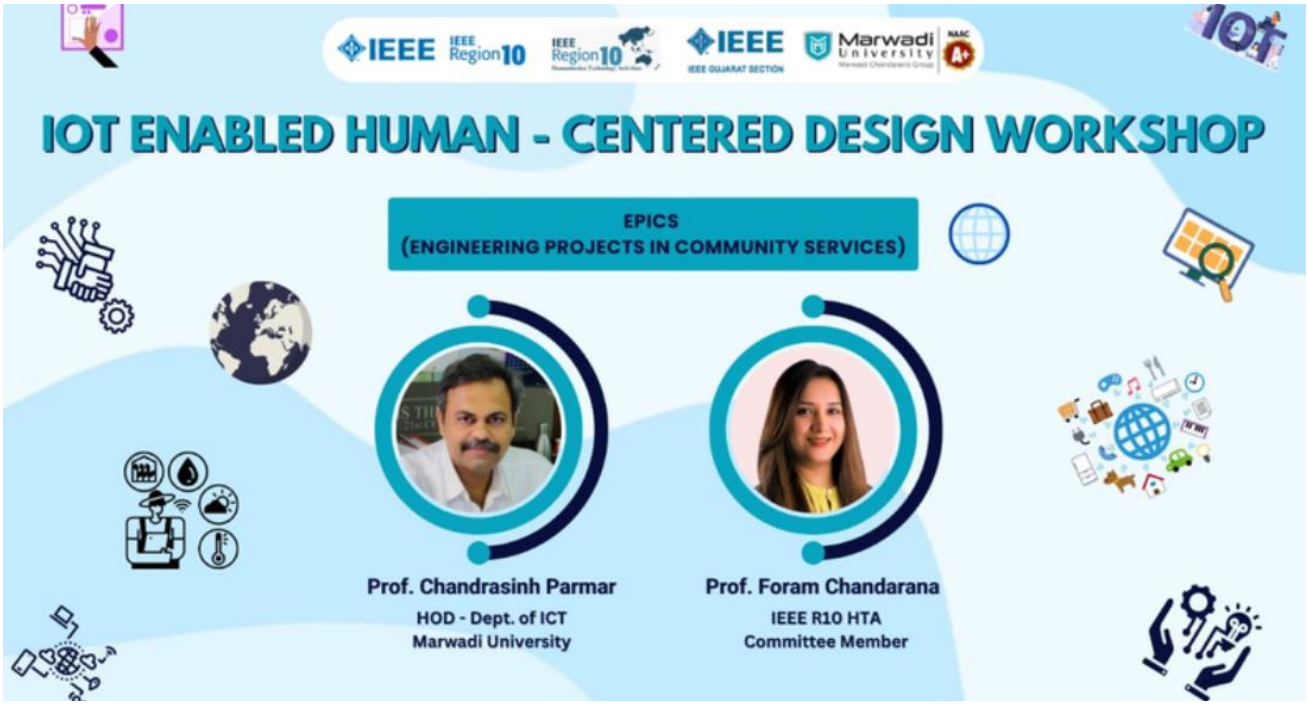


IOT Enabled Human-centered Design workshop

EVENT REPORT

DAY-1

Date: 5/10/2024

Time: 9:30-4:30

Location: MA102

Speakers: Prof. Chandrasinh Parmar

Prof. Foram Chandarana

Introduction

IEEE MEFGI SB organized a workshop on IOT Enabled Human-cantered Design under the guidance of Dr R B Jadeja Vice Chair, IEEE R10 Members Activities. The primary goal of the workshop was to explore how the Internet of Things (IoT) can enhance human-cantered design principles. Attendance at the event included participants from a variety of departments across the Marwadi University.

Opening Discussion

The workshop commenced with a thought-provoking question posed by Prof. Parmar and Prof Chandarana: “What is the purpose of engineering?” Students shared their diverse opinions, leading to a consensus that engineering serves to innovate for humanitarian causes and improve the quality of life.

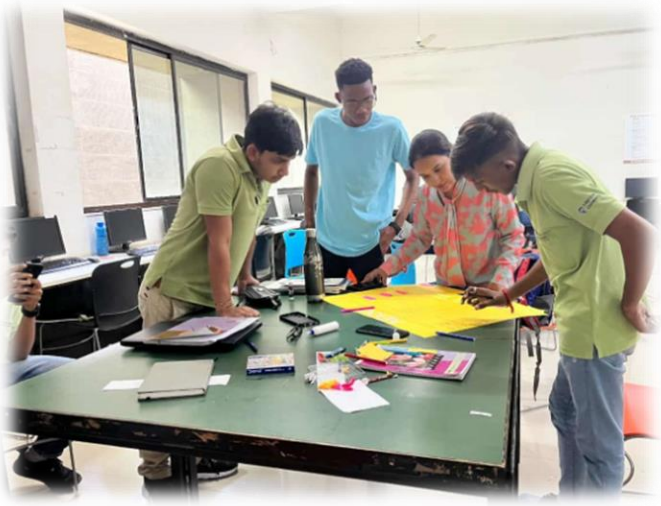
Interactive Session

An interactive segment featured a video on the IDEO shopping cart, illustrating the essence of innovative thinking. The video emphasized how innovation has transformed practices in various fields, notably in medicine. For instance, the traditional method of locating veins for punctures has been replaced by advanced machines that enhance accuracy and patient comfort.

The primary objective of this session was to cultivate problem-solving skills among students. Following the video, the attendees engaged in a discussion on its key takeaways. Participants reflected on the video’s message: “One conversation at a time, stay focused, encourage wild ideas.” The importance of non-judgmental discussions and team diversity was highlighted.

Candidate Introductions

To foster a collaborative environment, a brief 5-minute session was dedicated to introducing the candidates.



Workshop Phases

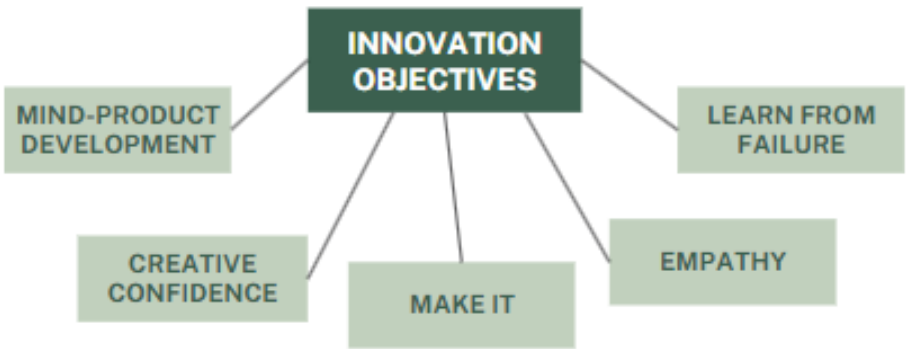
The workshop was structured into two distinct phases.

Phase One: Problem Scenarios

In the first phase, participants were divided into groups and presented with various problem scenarios, including child safety and driver safety. Each group was tasked with discussing solutions specifically related to driver safety. The enthusiasm and engagement from the students led to lively discussions, with each group contributing unique perspectives and solutions.

Phase Two: Innovation Objectives

The second phase began with a briefing on the objectives of innovation, which included:



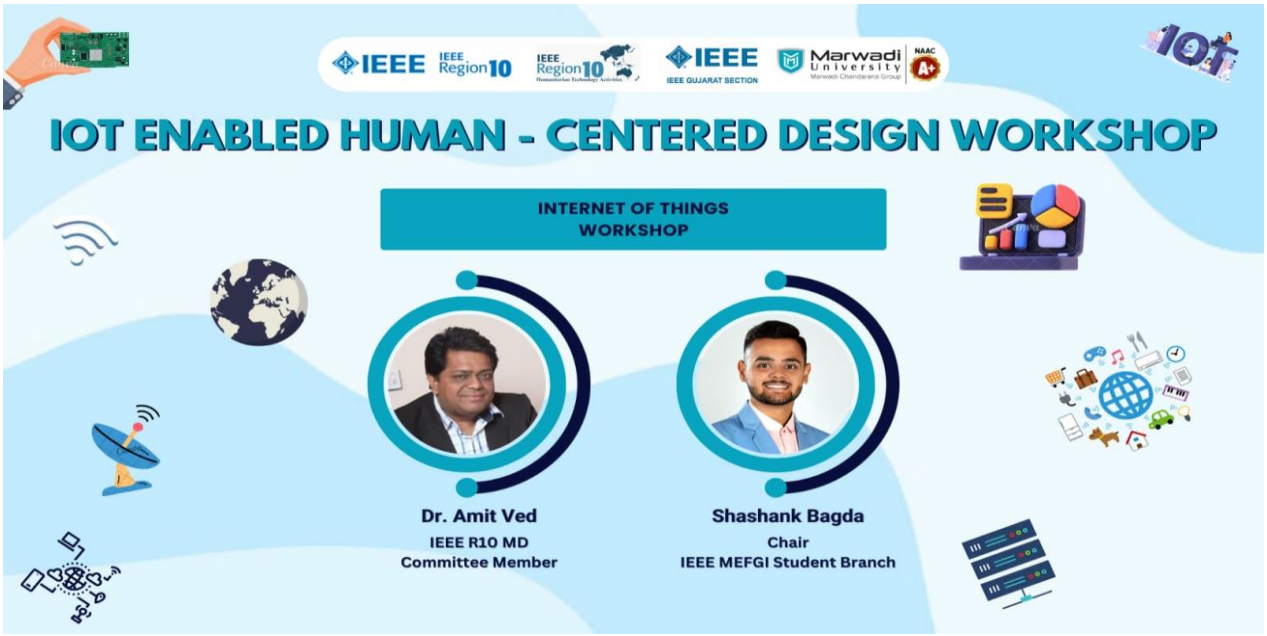
Following this overview, groups were assigned a specific task to address a problem within the domain of university life. Prof. Foram Chandarana and Prof. Chandrasinh Parmar provided detailed instructions, guiding participants to identify stakeholders, their activities, and interactions.

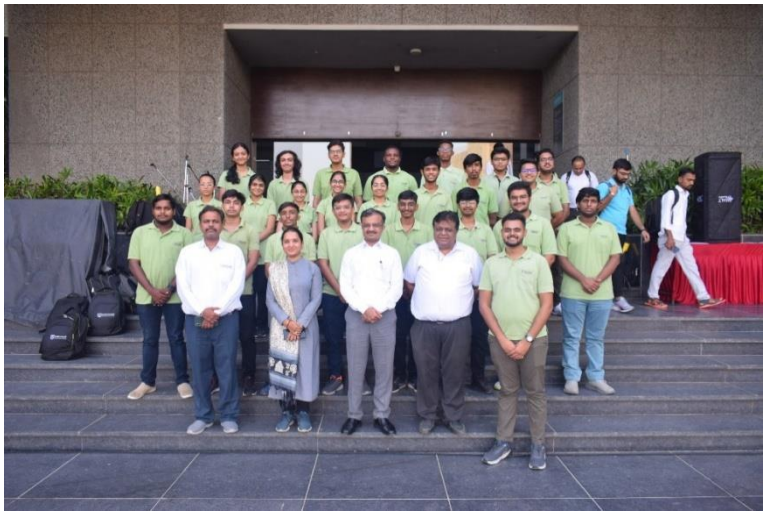
Introduction to AEIOU Framework

The workshop then shifted focus to the **AEIOU framework**—Activities, Environments, Interactions, Objects, and Users. This framework helps designers organize their observations and document contextual inquiries, ensuring a thorough understanding of the problem space.

Conclusion

The workshop successfully engaged students in meaningful discussions about innovation and problem-solving within engineering. The collaborative environment encouraged creativity and diverse thinking, setting the stage for the upcoming presentations where groups will share their findings on the designated topic of university life.





EVENT REPORT

DAY-2

Date: 7/10/2024

Time: 9:30-4:30

Location: MUIIR

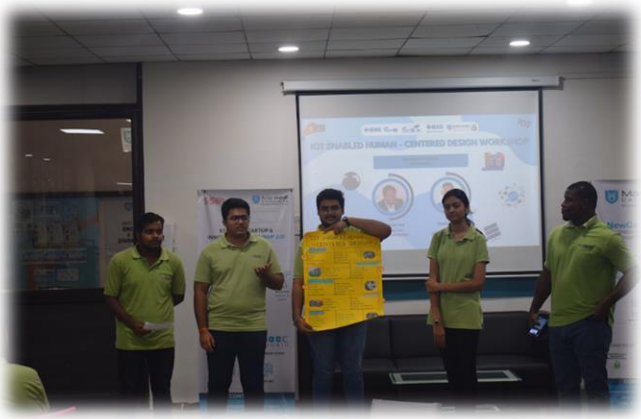
Speakers: Dr. Amit Ved, Mr. Shashank Bagda

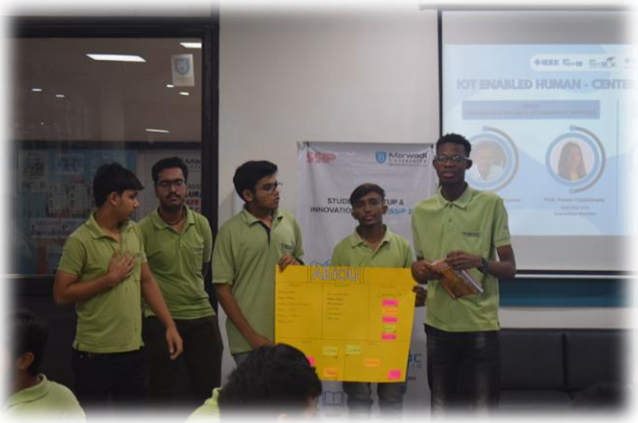
Session Commencement

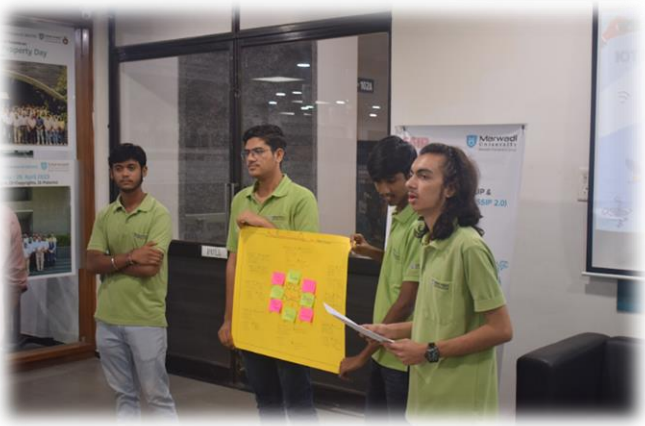
The second day began with **Prof. Foram Chandarana** welcoming everyone and setting the tone for an engaging session.

Group Presentations

Following her introduction, the group presentations continued, allowing participants to showcase their innovative solutions. Each team presented their ideas with enthusiasm, reinforcing the collaborative spirit of the workshop.



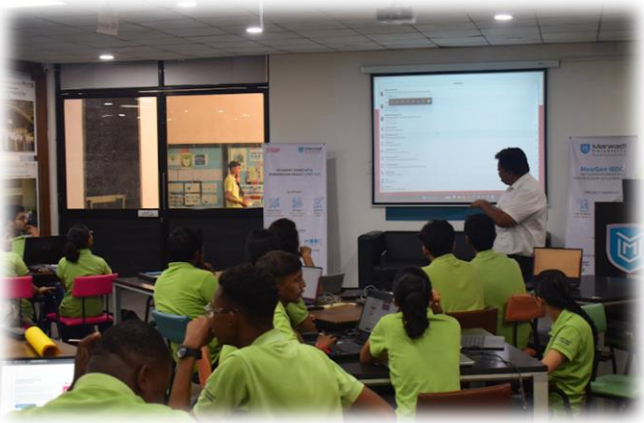




Transition to Amit Sir's Insights

After the presentations, **Amit Sir** took over the workshop, emphasizing that

"Every problem is unique, and every solution is unique." This statement set the stage for a deeper discussion about the topics covered on the first day.



Discussion on Technical Solutions

Participants revisited the solutions proposed in the earlier session, now incorporating technical terminology. It became clear that most solutions required a combination of processors, actuators, and sensors.

Video Presentation

Next, attendees watched a video on Amazon's automated warehouse, illustrating the real-world applications of IoT and automation technologies in optimizing operations.

Deep Dive into IoT Concepts

The discussion then transitioned to **IoT concepts**. Participants explored the following:

- **Definition of IoT**: Understanding it as a network of interconnected devices, encompassing both hardware and software.
- **IoT Evolution and Architecture**: The architecture includes key components such as sensing and identification, network construction, information processing, and integrated applications.

- **IoT Technologies**: Covering hardware, communication technologies, protocols, software, and cloud services.

Hands-On Experience with Raspberry Pi

The second half of the session was led by **Shashank Bhagda**, who provided a hands-on experience with **Raspberry Pi**. Participants learned about:

- **Components, Versions, and Key Features**: Understanding the hardware aspects of Raspberry Pi.
- **Operating System Installation**: Steps for installing Raspberry Pi OS, accessing via SSH, and utilizing headless mode.
- **GPIO Pins and Sensor Interfacing**: Connecting both analog and digital sensors.
- **Introduction to Cloud Services**: Exploring platforms like Google Cloud, AWS, and ThingSpeak.

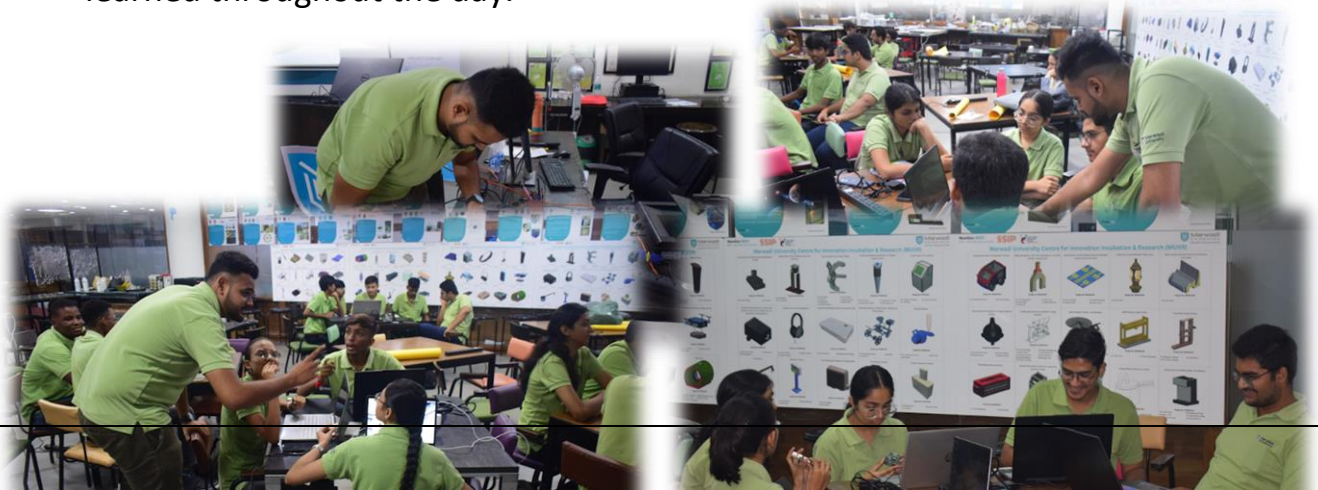
Experiments Conducted

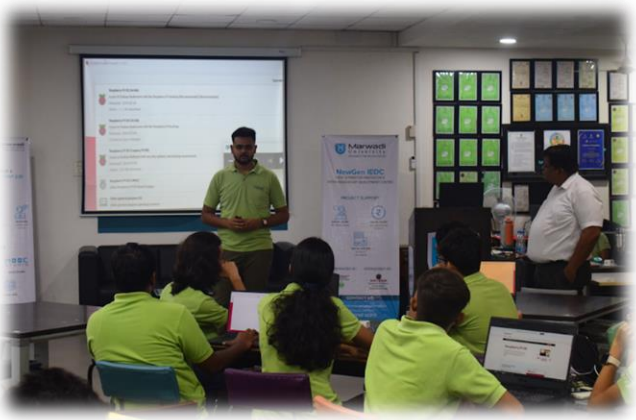
Participants engaged in several experiments:

1. **Data Communication**: Understanding how Raspberry Pi can communicate data.
2. **Connecting Raspberry Pi to Cloud**: Learning about the MQTT protocol for IoT communication.
3. **Overview of Actuators**: Discussing components like LEDs, relays, and motors and their roles in IoT applications.

Problem-Solving Scenarios

At the end of the session, Mr. Shashank presented several problem statements, inviting participants to propose solutions. This activity encouraged critical thinking and practical application of the concepts learned throughout the day.





Conclusion

Participants left the session feeling inspired and motivated to explore the IoT domain further. The hands-on experience with Raspberry Pi and the insights shared about IoT applications sparked interest in continued research and innovation in this rapidly evolving field.

A special thanks to **IEEE Region 10** and **Marwadi University** for organizing this enriching event and providing a platform for learning.